IX. PUBLIC NOTICE COMMENTS

The public notice period was from February 6, 2015 to April 9, 2015. Comments were received from a number of stakeholders, including the U.S. Environmental Protection Agency, XTO Energy Incorporated, Pioneer Natural Resources U.S.A, Inc., citizens in and around the Purgatoire Watershed, the Las Animas County Board of Commissioners, the Las Animas Farm Bureau, the Las Animas Landowners Bureau, and the Spanish Peaks Purgatoire River Conservation District. Topical summaries of the comments and the response of the Division are given below.

COMMENTS PERTAINING TO ALL PERMITS

Ranchers, Citizens of the Purgatoire Watershed Comments: Including the following: Anna Fusco, Anthony Borja, Christi Jones, Daryl Campbell, Dean Oatman, Dennis Barton, Dianna Bayes, Dottie Hill, Edie Fitzgerald, Grace Bolewicz, James Vigil, Jeff Lambeth, Jerry Aguirre, Jess Cannon, McDonald Ranch, Mike Messemer, Randy Campbell, Tom Verquer, Toni Lambeth, Tami Tamburelli (on behalf of Edward Hubright, Carol Bridges, Charles Van Orden, Kim Van Orden, Brent and Tami Tamburelli, Albert Martinez, Buford Garcia, Cindy Garcia, Zablan Garcia, Thomas Kosovich, Kimberly A. Kosovich, Jack Kosovich, Anne M. Kosovich, Jim Peters, Juanita Pateg, Kim Swafford, Brad Paine, Randee DeCristino, Gaylene DeCristino, David Gourdin) (signatures of other commenters were not legible)

Comment 1: By allowing the new, restrictive permits to become effective, the Water Quality Control Division (WQCD) will be forcing XTO Energy Incorporated and Pioneer Natural Resources U.S.A, Inc (herein referred to as the 'Companies') to inject the water, thereby removing the beneficial impact of the water that the Companies contribute to the watershed. The livestock and wildlife will suffer from lack of water, the fire risk will increase, and people could potentially lose their jobs if the Companies decide to close.

Response 1: The permits drafted by the WQCD for waste water discharge permits to surface water are written pursuant to and in conformity with regulations set forth by the Water Quality Control Commission (WQCC). The permit is meant to set forth permit limitations to ensure the protection of the water quality of the surface waters for all water uses, including irrigation, livestock watering, water supply, recreation, and aquatic life uses. For industrial discharges, the WQCD does not have the authority to dictate how any permittee meets permit effluent limitations for discharges into waters of the State. Thus, the selection of methodologies for water management of the discharge to meet effluent limitations is solely within the jurisdiction and discretion of the permittee. Should the permittee elect to inject its wastewater subsurface, that is a decision made by the Companies, and not the WQCD. Note that wastewater that is directly piped to non-discharging ponds, is not within the jurisdiction of CDPS permitting.

Las Animas County Board of Commissioners Comments:

Comment 2: First and foremost, the negative economic impact that the costs of implementing more stringent rules on the industry's ability to surface discharge some of the water that they

produce will be significant. Having to meet the cost of transporting produced water that will not meet stricter measures to disposal wells could result in less production activity in our county. We have already suffered the harmful effects of decreased activity by experiencing a greater than 50% reduction in property tax revenues derived from the CBM industry. In addition, traffic on already highly-traveled CO State Highway 12 and various county roads would increase significantly by the need for more water trucks to remove discharged water thus bringing higher maintenance costs to the county. The economic consequences would not just be to Las Animas County however, higher costs to the industry to remove produced water would cause of negative end result in areas from local employment to tourism.

Las Animas County has remained in drought conditions for much of the past decade. It is imperative that landowners and livestock owners here have access to quality reliable sources of water. Currently, the retention ponds that are in place blend into the existing environment and provide strategically-placed watering opportunities where others may not exist thus providing livestock, wild game, small mammals, and birds. It is our concern that ranching and tourism could be in jeopardy with less water availability.

Response 2: The evaluation of the economic impacts of the water quality standard and the resulting water quality-based effluent limit begins with the rulemaking hearing on the water quality standard before the Water Quality Control Commission ("Commission"). The Commission reviews water quality standards and classifications triennially. Pursuant to section 25-8-204(4) C.R.S., the Commission is required to consider the economic feasibility of treatment techniques, among other factors. As explained in its comment, the permittee could go to the Commission and make a showing that a standard is not economically feasible. The permittee went through this process for boron before the Commission in 2013 which resulted in a less stringent standard. Furthermore, the permittee participated in the most recent hearing on the Arkansas River Basin and could have advocated for different standards for iron, toxicity, and protection of irrigation uses. By establishing a numeric standard for iron and re-codifying the narrative standard for toxicity and irrigation uses the Commission determined that the standards are economically feasible.

The next part of the evaluation is the Division's work on the permit. Based on submittals and discussions with the permittee, the Division understands that the permittee predominately relies on operations changes to manage its pollution rather than using treatment. In fact, the Division understands that the permittee has not installed any treatment throughout the fields to reduce its concentrations of iron, WET or EC/SAR. Under the final permit the permittee maintains the same operational flexibility to manage its pollution. Furthermore, many of the effluent limitations in the final permit are less stringent than the previous permit. The Division is required to protect the classified uses, which include aquatic life and agricultural irrigation. These countervailing environmental and land use interests must also be considered and protected. Accordingly, because the permittee maintains operational flexibility to manage its pollution, and because there are other uses that will be harmed by water of a lesser quality, the water quality–based effluent limits are necessary to protect the uses.

Additionally, pursuant to section 25-8-503(4), C.R.S., the Division is prohibited from issuing a permit, "which allows a discharge that by itself or in combination with other pollution will result

in pollution of the receiving water in excess of the pollution permitted by an applicable water quality standard unless the permit contains effluent limitations and a schedule of compliance specifying treatment requirements…" Under section 25-8-503(4), C.R.S., it is clear that the Division does not have flexibility to issue a permit with an effluent limitations that would allow a discharge to exceed the pollution permitted by a water quality standard. Accordingly, based on the General Assembly's mandate the Division must include effluent limitations in permits that do not exceed the water quality standard.

Comment 3: Existing data indicates that water currently being discharged into the Purgatoire River has not impacted the water's suitability for protected uses. In fact, the industry voluntarily monitors discharge points throughout their operating area to ensure that the quality of water meets the state's standards. They have complied with state standards and been good partners with county property owners who have enjoyed access to produced water. Despite these efforts, WQCD has continually increased the permit limits making it more difficult for XTO and Pioneer to discharge the produced water. We believe that the standards in their draft permits are overly excessive and unnecessary.

We urge the WQCD to withdraw and reconsider these draft permits. The standards are overly excessive and unnecessary and will force both XTO Energy and Pioneer Natural Resources to preclude landowners from utilizing a valuable resource in this county.

Response 3: The permits drafted by the WQCD for waste water discharge permits to surface water are written pursuant to and in conformance with the regulations set forth by the Water Quality Control Commission (WQCC). The permit is meant to set forth permit limitations to ensure the protection of the water quality of the surface waters for all water uses, including irrigation, livestock watering, water supply, recreation, and aquatic life uses. The Division is bound by the standards set forth by the Water Quality Control Commission (WQCC). The opportunity to comment and make a case for different standards during the triennial review of the Arkansas Water Basin was in 2013 and 2014, and the Companies succeeded in proposing new, less stringent standards for boron. No cases were made for the other parameters.

U.S. Environmental Protection Agency:

Comment 4: For the draft permits CO-0048062, CO-0048003, CO-0047776, and CO-0047767, the justification for how the produced water will be used for agricultural and wildlife propagation does not meet the minimum requirement in 40 CFR Part 435 Subpart E. The fact sheets for the draft permits fails to explain how the produced water is of good enough quality to be used for wildlife or agricultural purpose (e.g. complies with State WQS, is based upon literature/studies to establish limitations which are protective of livestock and wildlife consumption, etc.) and that the water is actually put to such use during periods of discharge (e.g. beneficial uses documentation, written letters from the users such as ranchers or State Game/Wildlife Department, etc.) EPA requests that the State include additional information in the final permits to comply with the minimum requirements in 40 CFR Part 435 Subpart E.

Response 4: The limitation of 3,500 mg/l for TDS for livestock watering was implemented based on EPA's "Blue Book" (*Water Quality Criteria 1972 ("Blue Book")*. U.S. Environmental

Protection Agency. Wash., D.C.: U.S. Gov't Printing Office, #R3-73-003, 3/73. The "*Blue Book*" was developed by a Committee on Water Quality Criteria formed through the National Academy of Sciences. The Colorado State University (CSU) Cooperative Extension also uses the "Blue Book" values as recommendations for livestock watering (*Livestock Drinking Water Quality,* CSU Cooperative Extension, October 1993, Reviewed March 1999). The Division has had a longstanding practice of applying the 3500 mg/L level as an effluent limit to protect for the livestock use. The TDS "*Blue Book*" guidelines follow below:

Guide to the use of saline waters for livestock and poultry. (Table V-3 in the Water Quality Criteria 1972)

Total soluble salts content of waters	Uses
Less than 1,000 mg/L	Relatively low level of salinity. Excellent for all classes of livestock and poultry
1,000-3,000 mg/L	Very satisfactory for all classes of livestock and poultry. May cause temporary and mild diarrhea in livestock not accustomed to them; may cause watery droppings in poultry.
3,000-5,000 mg/L	Satisfactory for livestock, but may cause temporary diarrhea or be refused at first by animals not accustomed to them. Poor water for poultry, causing watery feces, increased mortality, and decreased growth, especially in turkeys.
5,000-7,000 mg/L	Can be used with reasonable safety for dairy and beef cattle, sheep, swine, and horses. Avoid use for pregnant or lactating animals. Not acceptable for poultry.
7,000-10,000 mg/L	Unfit for poultry and probably for swine. Considerable risk in using for pregnant or lactating cows, horses or sheep, or for the young of these species. In general, use should be avoided although older ruminants, horses, poultry, and swine may subsist on them under certain conditions.

Sources: Environmental Studies Board, Nat. Acad. of Sci., Nat. Acad. of Eng., Water Quality Criteria, 1972.
Ayers, R.S. and D.W. Westcot. Water Quality for Agriculture. Food and Agriculture Organization of the United Nations, Rome, 1976.

Based on the studies and recommendations above, TDS should less than 3,500 mg/l is considered by the Division to be safe for livestock watering. For the previous permit term, out of all the outfalls for all facilities, only one outfall (230A) for permit CO0047767 exceeded this standard at 4100 mg/l. All other recorded results are within the established limitation.

The fact that the water is put to actual use for livestock watering has been substantiated through information provided through previous permit actions, where the ELG as also applied under the Division's BPJ authority. This was also substantiated in comments received on the draft of this renewal permit submitted by the citizens of the Purgatoire Watershed that maintain that the local wildlife does indeed utilize the water present, along with numerous photographs as evidence of the presence of wildlife using the water. Therefore, the minimum requirement in 40 CFR Part 435 Subpart E is met. Specifically, the produced water is of good enough quality to be used for wildlife or livestock watering or other agricultural uses and the produced water is actually put to such use during periods of discharge.

Comment 5: WET Instream Compliance Monitoring – 40 CFR Part 122.47(a)(1) of the NPDES regulations and as established in the May 10, 2007 Jim Hanlon Memorandum states "any schedules of compliance under this section shall require compliance *as soon as possible*…" Based on the evaluation of these fact sheets, it appears that these permits have previously had chronic WET limits with an associated compliance schedule to determine the toxicants and come into compliance. It is not clear whether the extension of the compliance schedules for these permits represent the requirement of "compliance as soon as possible". The Division should provide adequate justification to warrant the extension of these compliance schedules. However, EPA agrees that a compliance schedule is warranted for those outfalls in the CBM permits with newly established chronic WET limits as a result of the Division's evaluation of the instream waste concentration.

Response 5: The Division agrees that the regulatory framework requires compliance "as soon as possible". The Division also agrees that a consideration for extending an existing compliance schedule is how much progress was made during the previous permit term towards compliance. With previous schedules for WET, the permittee has identified the toxicant and alternatives for compliance including various treatment options and underground injection.

In this case the Division determined that an appropriate compliance schedule duration in this case is 24 months. This timeline provides reasonable time to design, install, and operate treatment for WET and iron. The treatment would not only need to remove the sodium bicarbonate (an identified toxicant) but also remove iron at some outfalls where reductions are needed to comply with effluent limitations. The 24 month timeline was developed based on treatment options applicable in this case, including oxidation to remove iron, followed by settling and then membrane filtration to remove sodium bicarbonate for the portion of the discharge necessary to meet the WET limit. The permittee may also elect to implement underground injection in that timeline. The permittee has indicated that underground injection is their preferred option. Assuming that the permit will be effective July 1, 2015, the following compliance schedule is included in their permit:

1. By December 31, 2015, hire a professional engineering consultant to design the wastewater treatment processes or indicate that underground injection or other method will be implemented.
2. By July 1, 2016, initiate construction of the wastewater treatment processes or provide a progress update on actions taken to complete underground injection or other method selected by the permittee to comply with the effluent limitation.
3. By July 1, 2017, complete construction of wastewater treatment facility and have all waste streams treated by the wastewater treatment facility or complete underground injection or other method selected by the permittee to comply with the effluent limitation.

This will effectively extend the compliance dates in the current administratively extended permits by 24 months, and extends the compliance dates by six months over the timeline included in the draft of this renewal permit. This compliance schedule is considered "as soon as possible."

XTO and Pioneer: General Comments

Comment 6: Economic, Environmental, Energy, and Public Health Costs and Impact of Draft Permits Are Not Reasonable

The Colorado Water Quality Control Act mandates that water decisions by the Division are reasonable and consider the economic, environmental, energy and public health impacts and costs of those actions. C.R.S. § 25-8-102(5).

Specifically, the Division is directed when issuing permits that require treatment to protect water quality standards (and beyond technology-based requirements), that it "must determine whether or not any or all of the water-quality-standard-based effluent limits are reasonably related to the economic, environmental, public health and energy impact to the public and affected persons." C.R.S. § 25-8-503(8). The Division erred in its rudimentary, formulaic conclusion that "the water-quality-standard-based effluent limitations of this permit are determined to be reasonably related to the economic, environmental, public health and energy impacts to the public and affected persons." *See* 48054 Fact Sheet at 68; 47767 Fact Sheet at 42.

> In part, the Division's conclusion is premised on its finding that "the evaluation for this permit shows that the WQCC, during their proceedings to adopt the Classifications and Variance Standards for Arkansas River Basing, Regulation 32, considered economic reasonableness." The Companies submitted extensive evidence during the Arkansas River hearings (2013) that compliance with certain water quality standards (e.g., boron) was neither technically nor economically feasible. *See* Rebuttal Statement, "Compliance with Existing Standard is Not Technically or Economically Feasible," at 11. The Commission accepted the Companies' position on technical and economic infeasibility (and unreasonableness) and approved the modified boron standards as proposed.
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> However, the discussion, and conclusions are not limited to just boron standards. Further, permit modifications for iron, WET and EC/SAR were submitted because of the impossibility—technically and economically—of meeting the proposed discharge limits (and required control measures).

Ergo, the only feasible technical option would be to inject the produced water. Injection of produced water was central to the Commission's 2013 hearings in the Arkansas River – injection meant that the produced water would never again be available to landowners and communities in the Las Animas County and the Arkansas Basin.

> You are currently faced with the very important decision of deciding whether or not we will continue to have access to our most precious resource: the discharge water from the gas wells. Your decision will impact hundreds of ranchers and farmers who have come to depend on this discharge water to keep their operations viable.

Testimony of T. Tamberelli, WQCC Hearing re: Classifications and Numeric Standards for Arkansas River Basin, Regulation #32 (June 11, 2013). Further, at a capital cost of $111 - $184M plus annual operating costs of $1.8M, injection was not economically reasonable.

1. Additional Evidence That The Water-Quality-Standard-Based Effluent Limits Are Not Technically or Economically Feasible.

At the request of the Companies, Harvey Economics updated its 2013 economic evaluation of the Raton CBM operations. *See* Harvey 2015.

The report found:

In Las Animas County, CBM gas has been extracted from the Raton Basin for over 15 years. CBM industry activity and the associated produced water has the potential to continue to provide real benefit to the local economy in terms of employment, income and various revenues.

Changes in permit limits or other regulations affecting the discharge of produced water have the potential for increasing associated discharge costs, if treatment is required, or for the re-injection of additional water. Additional costs related to treatment of produced water may result in a reduction of CBM activity. Likewise, the high costs of re-injection wells may also have the potential for reducing gas extraction activities. An additional downside of re-injection is that produced water would become unavailable for any beneficial use in Las Animas County or in the Arkansas Basin, where all water supplies are sorely needed.

As this report shows, CBM industry activities, including the production of water, provide valuable benefits to the residents and jurisdictions of Las Animas County. Curtailment of CBM production in Las Animas County or re-injection of produced waters would have the following economic impacts:

- Reduction in water available for use by the agriculture and tourism/ recreation industries – reduced volume of agricultural activity or visitation to the area for hunting or other activities. Reduced activity in these industries will also lead to reduced employment and income in the county;
- Reduction in company employment and expenditures – local employment and spending by CBM companies would be reduced, along with sales tax revenue for the City of Trinidad or others;
- Reduction in royalty payments and various tax payments – royalty payments to private landowners would be reduced, as would the amount of severance taxes and FML revenues received by the county and local jurisdictions;

- Lower economic activity countywide – overall, reduced CBM mining activity and water production will result in a decline in employment and personal income, reduced local spending and fiscal impacts to both state and local governments.

2. Effluent Limits Imposed Are Derived From Policies, Not Standards**.**
Effluent limits for EC/SAR and WET testing are derived from policies – policies that purportedly interpret and apply narrative standards. These are not numeric water quality standards that were considered when the Commission adopted the narrative standards for agriculture or aquatic life. When the Commission adopted narrative standards applicable to the Arkansas River Basin, these specific policies for EC/SAR and WET were not contemplated. Similarly, the CBM industry was still emerging in the Basin and what would be reasonable for a mature industry and a mature field in decline was not contemplated. Therefore, the Division's presumption that the Commission considered the economic reasonableness for EC/SAR effluent limits and WET testing requirements is not supported.

Response 6:
Section 25-8-503(8) states,

> where a permit *requires treatment* to levels necessary to protect water quality standards and beyond level required by technology-based effluent limitation requirements, the division must determine whether or not any or all of the water-quality-standard-based effluent limitations are reasonably related to the economic, environmental, public health, and energy impact to the public and affected persons, and are in furtherance of the policies set forth in sections 25-8-102 and 25-8-104. (emphasis added).

Neither the draft nor the final permit require the permittee to install treatment to meet water quality standards. To the contrary, the draft and final permits allow the permittee operational flexibility to determine how to meet the all effluent limitations. The permittee can, and it's the Division's understanding that the permittee does have a variety of non-treatment operational practices that it uses to meet its permit limitations, including but not limited to underground injection, blending produced water, operating certain wells during certain time periods, and pulling water from different formations within each well.

However, assuming that the Division is required to "determine whether or not any or all of the water-quality-standard-based effluent limitations are reasonably related to the economic, environmental, public health, and energy impact to the public and affected persons, and are in furtherance of the policies set forth in sections 25-8-102 and 25-8-104," the Division has determined that the water-quality-standard-based effluent limitations in the permit are reasonably related to economic, environmental, public health, and energy impact to the public and affected persons and are in furtherance of section 25-8-102 and 25-8-104, C.R.S.

The evaluation of the impacts of the water quality standard and the resulting water quality-based effluent limit begins with the rulemaking hearing on the water quality standard before the Water Quality Control Commission ("Commission"). The Commission reviews water quality standards and classifications triennially. Pursuant to section 25-8-204(4) C.R.S., the Commission is required to consider the economic feasibility of treatment techniques, among other factors. As

explained in its comment, the permittee could go to the Commission and make a showing that a standard is not economically or technically feasible. The permittee went through this process for boron before the Commission in 2013. Furthermore, the permittee participated in the most recent hearing on the Arkansas River Basin and could have advocated for different standards for iron, toxicity, and protection of irrigation uses. By establishing a numeric standard for iron and re-codifying the narrative standard for toxicity and irrigation uses the Commission determined that the standards are economically and technically feasible.

The next part of the evaluation is the Division's work on the permit. Based on submittals and discussions with the permittee, the Division understands that the permittee predominately relies on operations changes to manage its pollution rather than using treatment. In fact, the Division understands that the permittee has not installed any treatment throughout the fields to reduce its concentrations of iron, WET or EC/SAR. Under the final permit the permittee maintains the same operational flexibility to manage its pollution. Furthermore, many of the effluent limitations in the final permit are less stringent than the previous permit. The Division is required to protect the classified uses, which include aquatic life and agricultural irrigation. These countervailing environmental and land use interests must also be considered and protected. Accordingly, because the permittee maintains operational flexibility to manage its pollution, and because there are other uses that will be harmed by pollution, the water quality – based effluent limit is reasonably related to the economic, environmental, public health, and energy impact to the public and affected persons, and furthers the policies set forth in sections 25-8-102 and 25-8-104

Additionally, pursuant to section 25-8-503(4), C.R.S., the Division is prohibited from issuing a permit, "which allows a discharge that by itself or in combination with other pollution will result in pollution of the receiving water in excess of the pollution permitted by an applicable water quality standard unless the permit contains effluent limitations and a schedule of compliance specifying treatment requirements…" When sections 25-8-503(4) and 25-8-503(8), C.R.S., are read together, it is clear that the Division does not have flexibility to issue a permit with an effluent limitations that would allow a discharge to exceed the pollution permitted by a water quality standard. Where section 25-8-503(4) prohibits a particular action of the Division, section 25-8-503(8) only requires a determination not an action. Therefore, the Division must include effluent limitations in permits that do not exceed the water quality standard.

Comment 7: Risk-Based Permit Renewal

A common sense approach to permit renewals is incorporated in the permitting process but it has not been used by the Division in preparing the Draft Permits. The Division could issue these permits with minimal or no change after performing a risk-based evaluation. The risk-base evaluation is completed – the extensive watershed information data demonstrates that discharges at current levels produce water that is beneficial for crops, livestock, wildlife, aquatic life and recreation.

Regulation 61 states that the Division has the obligation to reissue discharge permits with minimal or no change after performing a risk-based evaluation. 5 C.C.R. § 1002-61. Specifically, Regulation 61.1(5) reads:

> For any permit, at the time of permit renewal, the Division shall use a risk-based approach applied to the receiving water(s) that considers the most recent water quality/quantity information, information in the renewal application, and any other relevant information, to determine whether the permit can be reissued with minimal or no change.
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> In their December 2013 Permit Renewal Applications, the Companies provided the Division with extensive water quality data collected throughout the watershed from the Purgatoire River Watershed Monitoring Network. The Division is also in receipt of more recent data collected under the Level 1 and Level 2 monitoring programs in the current permits. These data demonstrate that applicable water quality standards for boron, chloride, EC, SAR and WET are met throughout the watershed. And, although iron levels in the Purgatoire River exceed standards, those exceedances have been consistent for many years, even pre-CBM operations. No increase in iron concentration has occurred, or been attributable to produced CBM water.
>
> Thus, the "current condition" of the surface water quality in the Purgatoire watershed continues to be protective of designated uses after over 15 years of CBM operations.

Notwithstanding the water quality data, the Division has issued draft permits which have major, significant changes to terms and limits.

Response 7: The Division disagrees that issuing the renewal permits with little or no change is appropriate in this case, or required by section 61.1(5). Further, comments on the draft permit submitted by the permittees (contained herein), include requests to utilize different or additional data or approaches, and thus are inconsistent with this comment.

The regulatory citation contained in 61.1 (5) in no way directs, or "obligates" the Division to reissue permits with little, or no changes. Rather, the regulation states that the Division is obligated *to determine* if a permit can be issued with minimal changes. However, certain conditions preclude the application of a risk-based permit renewal as described in 61.51, the Statement of Basis, Specific Statutory Authority, and Purpose-May 2002 Rulemaking – HB 01-1032 Implementing Regulations;

> House Bill 01-1032 was passed by the legislature in the 2001 session and provides for a risk-based approach to streamline the permit renewal process where *minimal changes in permit conditions are necessary* (emphasis added). Thus, The Commission adopted a new subsection, 61.1(5), to address the aspect of the statute.
>
> The ability of the Division to reissue permits with little or no change as contemplated by HB 01-1032 is complicated by the fact that there have been a number of additions to the regulatory framework applicable to permits for discharges to surface waters, such as revisions to the antidegradation and mixing zone regulations. In addition, the level of ambient flow and chemistry data collected on many streams has increased and this "new" information must be considered at the time of permit renewal. In the near term, many of the permits for operations that discharge to surface waters will be affected by one or more of these changes and will require a comprehensive analysis to determine applicable water quality standards-based effluent limits. In addition, where additional effluent data are collected by permittees, these data must be evaluated to determine the "reasonable potential" for the discharge to cause or contribute to a water quality standards violation.

Thus, because standards, receiving water flows, mixing zones, ambient water quality, facility operations and effluent quality change within a 5-year time frame, this 'new' information must be evaluated prior to issuance of a new 5 year permit. Thus, the Division maintains that it is obligated to address changes within the entire regulatory framework (i.e. modified regulations, new policies, data, etc.) as it relates to water quality. Further, the Division is required to consider potential exceedances to numeric and narrative water quality standards via a "reasonable potential analysis" to determine the potential for the discharge to cause or contribute to an exceedance of a water quality standard including, but not limited to, SAR, Iron, Boron, and Whole Effluent Toxicity. This evaluation considers effluent data during the permit term, and evaluates data, both statistically and qualitatively.

In addition to evaluating effluent data, several regulatory changes have taken place since the last permit was issued in 2009. These changes include;

Regulation 32 Classification and Numeric Standards for Arkansas River Basin, WQCC 2013

- Segmentation changes occurred throughout
- The water quality standard for boron was changed from 0.75 mg/l to 2mg/l or 4 mg/l for all segments included in this permitting action (COARLA04b, COARLA05a, COARLA6a).
- The water quality standards for temperature were modified FROM ADD TO ADD, and a temporary modification for "current condition" was promulgated until July 1, 2016
- The water quality standard for total recoverable iron (TR Fe) was changed on Segment COARLA04b from 1,805 ug/l to 1,000 ug/l.
- A temporary modification for total recoverable arsenic (TR As) from 0.02 ug/l to "Hybrid" (current condition) was promulgated until January 1, 2022.
- Total Recoverable Trivalanet Chromium was added to segments ADD

The permittee submitted hydrologic evaluations and "new" data including, respectively;

Flow- The low flow evaluations were updated in this permit renewal, incorporating new flow information to continuing to ensure that the low flow conditions in the receiving streams are appropriately characterized. The Division notes that comments by the permittees indicate a consensus on the need to accurately characterize and update receiving water flow. For example, in one of the comments;

> Flow determinations for the receiving waters that are not correct or not supported by monitoring data permeate the Draft Permits because flows are directly related to permit limits. The streamflow data provided to the Division by Tetra Tech in December 2013 will provide higher 1E3, 7E3, and 30E3 low flows for these receiving streams than the estimated low flows currently used in the Draft Permits.

For example the low flow for the Purgatoire River increased slightly in this permit renewal, and flow was included for Guajatoyah Creek, which was previously characterized as a zero low flow

waterbody (with no dilution available). Thus, in most cases, updated flow evaluations, which include an expanded period of record, minimize (though still consider) the effects of the drought year. As a consequence of this update, water-quality based effluent limitations (WQBELs) increase slightly (and permit limits become less stringent) due to increases in available dilution.

> Ambient Water Quality- The ambient water quality was also updated in this permit renewal, where available, and applicable. Note that these updates included exhaustive evaluations using hardness data supplied by the permittee from the Purgatoire Monitoring Network. The new information was utilized and incorporated *for each tributary*, where available. This was extensive analyses as demonstrated by the 11 hardness-based TVS equation tables (4a-4k) in the WQA. Hardness directly impacts WQBELs as TVS metals standards are hardness dependent. As a result of using new data from the Purgatoire Monitoring Network, however, the TVS metal standards more accurately reflect the aquatic habitat of the receiving waters.

Additionally, there were also facility changes from the previous permit, including decommissioning several outfalls (e.g. Wet Canyon, Valdez Canyon), removal of the Red River Ranch CBM operation based on their request to terminate their discharge permit in 2014, and a reduction in permitted flow for the New Elk mine from 3.6 MGD to 1.1 MGD. These changes in the discharge regime and associated volumes facilitated the re-allocation of additional flow to the remaining discharges (Pioneer and XTO) to the Purgatoire River.

Finally, the Division is re-evaluating antidegradation-based limitations, in part due to an alternative analysis conducted and submitted by the permittees.

Thus, the Division considered a risk-based approach, but determined that section 61.1(5), including the purpose and intent as explained in the Statement of Basis and Purpose language, as described herein, does not apply to these discharges at this time, for the myriad reasons stated above. Re-issuing a permit with no changes based on periodic instream samples, and soil monitoring is not consistent with the nature and intent of the regulation.

Comment 8: Draft Permits Are Not Consistent with the State Water Plan
Governor Hickenlooper directed the Colorado Water Conservation Board, Department of Natural Resources, in concert with other agencies such as CDPHE, to develop a state water plan. That plan addresses the needs and shortfalls for each river basin, including the Arkansas River Basin. Colorado Water Conservation Board, "Colorado's Water Plan" (draft dated Dec. 10, 2014) ("State Water Plan").

The draft Arkansas River Basin Implementation Plan (draft July 31, 2014) ("Arkansas River BIP"), which is a component of the draft State Water Plan, recognizes that the water supply gap in the Arkansas River basin will widen without successful completion of creative plans and projects. The Arkansas Basin has significant inter-basin and interstate obligations. As such, it must "maximize the use of existing water supplies" and "take all actions required to maintain current water supplies and prevent future water supply gaps from increasing." Arkansas BIP at 8, 43.

1. Agriculture.
Agriculture is the largest water use in the Basin; agricultural use accounts for about 87 percent of total water withdrawals. The Basin contains 428,000 irrigated acres, with about one million AF of crop water demand annually. Current irrigation shortages exceed 450,000 AF per year. Given the projected decrease in future irrigated acres, shortages are anticipated to be approximately 370,000 AF per year by 2050. The State Water Plan and the Arkansas River BIP identify an augmentation gap of up to 50,000 AF by 2050.

2. Municipal and Industrial ("M&I") use.
The population of the Arkansas Basin is expected to grow from just over 1 million people in 2013 to between 1.58 million and 1.84 million people by 2050; an increase of between 53 and 79 percent. M&I water use is currently a small portion of Basin demand (about 10 percent of total water withdrawals). However, due to future population growth, M&I demands are projected to reach between 298,000 AF and 352,000 AF by 2050, an increase of up to 170,000 AF. Shortages of at least 45,000 AF, and possibly as much as 94,000 AF, are anticipated by 2050.

3. Environmental and recreational use.
The State Water Plan and the Arkansas River BIP identify a number of goals for nonconsumptive water uses in the Basin; these goals include maintaining and improving fish and wildlife populations and habitats, boating and other recreational opportunities, and wetland areas.

Environmental needs in the Basin include water for wetlands, birding areas, and threatened and endangered species. Numerous wetlands are present throughout the Basin. Recreational needs include water for boating, fishing and hunting. Recreational boating includes both whitewater and flatwater boating for commercial and private purposes. Fishing is a popular activity, which occurs at numerous reservoirs, lakes, rivers, streams and smaller tributaries throughout the Basin. The Arkansas Basin also includes prime waterfowl hunting areas and habitat for other commonly hunted large and small game species.

4. Water quality decisions must consider and further State Water Plan goals.
The Division's decisions on the Draft Permits must consider the value, and need, for the water produced by XTO and Pioneer. Every drop of water in the Arkansas Basin is potentially part of the solution to address existing shortfalls in the basin, which are estimated to increase to 36,000-110,000 AF by 2050.

Water produced from CBM operations in the upper Purgatoire watershed tributaries have provided between 4,500 and 8,000 AF of water per year. Produced water discharged into the Purgatoire watershed presently supports stock watering, wildlife habitat, and downstream river calls for agricultural uses. This is an important resource that should remain available to reduce the water gap for local and regional uses.

> Therefore, all available or potential water sources must be considered for suitability in meeting the Basin's water gaps, including CBM water. CBM-produced water is an existing source of water supply available to Basin water users to help meet a portion of current and future water needs; this source of water should be included in the evaluation of water management for the Arkansas Basin.
>
> CBM water discharged into Purgatoire River tributaries adds to the Purgatoire mainstem flow and annually provides water for agricultural and recreational activities that alleviates the pressure on other water supply sources.2 CBM water becomes even more important in dry years when it represents a greater portion of total supply. CBM water is generally available throughout the year; its value increases in low flow periods of the growing season. The loss of CBM water would result in a reduced volume of water in the Purgatoire for all uses and associated benefits. In fact, any reduction in the amount of CBM water discharged to surface water would further exacerbate the estimated water demand gap for beneficial uses within the Basin, including M&I, agriculture, environmental, and recreational uses.
>
> When issuing permits, such as these Draft Permits, the Division should balance water quality with consideration for physical water supplies and their attendant water rights and values to downstream users. A balance between water supplies and water quality is achieved by maintaining the status quo with discharges and produced water at historic levels. Unbalanced permitting decisions, such as the effluent limits proposed in these Draft Permits, will cause produced water to be injected or the Companies will consider limiting or curtailing gas operations that produce this water.

Response 8: The draft state water plan does not suggest or require that water quality requirements and considerations yield to water quantity requirements and considerations as suggested in the comment. To the contrary, in Executive Order D 2013-005 Governor Hickenlooper explicitly recognized that one purpose of the water plan was to address water quantity and water quality "conjunctively," that these issues can no longer be thought of separately. In fact the water plan explicitly acknowledged the important role that water quality plays in managing the state's water supply. The draft water plan states,

> Colorado's Water Plan encourages the integration of water quantity and water quality concerns through the following approach: [r]ecognizing the inter-relationship between quality and quantity, strategies designed to meet Colorado's current and future consumptive, recreational and environmental water needs will incorporate, as a key objective, the protection and restoration of water quality. Coloradans have a strong connection to water. The quality of water in the state needs to be protected, and in some cases restored to support Colorado's heritage, communities, and way of life – now and into the future…Opportunities to address existing water quality impact and minimize future impact must be prioritized to ensure Coloradans continue to have access to safe and clean water. Final Draft Water Plan at 256.

In the arid west, water scarcity is a difficult and real issue. The Division is committed to collaborating and engaging in the water plan, in fact members of the Division staff actively participated in the development and drafting of the draft water plan. Given the predicted scarcity of water in the future it remains even more vital that the water that is available is of a safe and usable quality.

Comment 9: Request for Facilitated Discussion
The Companies request a facilitated discussion with the Division to address the terms, limits and restrictions in the Draft Permits, the permitting process and other related matters. The discussions must be fair and reasonable; the facilitator must be unbiased, have a strong background in discharge permits and water rights, be approved by the Division and the Companies, and the Division and Companies must be able to freely select their representative for the facilitation. For over five years, the Companies have engaged with the Division on the potential effluent limits for these discharges. The Companies, after conferring with the Division and other regulatory agencies, have undertaken special water quality, water quality monitoring, aquatic life and biologic monitoring and river restoration planning – all to determine suitable discharge limits.

The direct communications have not resulted in decisions that were informed by the Companies' science, available data, water quality monitoring or plans that were previously submitted to the Division. We request that the Division and Companies select a facilitator who can assist with the dialogue, expand the understanding between the parties, and potentially result in attainable and reasonable discharge permit limits that balance the community needs for water supply with water quality.

Response 9: The permittee and the Division entered into an Agreement to Engage in Facilitated Discussion on May 8, 2015 which reflects the criteria for the facilitator as set forth in the comment. The Division disagrees that the communications between the permittee and the Division "have not resulted in decisions that were informed by the Companies' science, available data, water quality monitoring or plans." As explained at length in both this response to comments and the fact sheet, the Division has seriously considered all information provided by the permittee and its decisions were informed by that information.

XTO and Pioneer: Comments on WET Testing

Comment 10: WET Testing Requirements Must Consider Present Aquatic Life Conditions
The protection of aquatic life in the river is important. Because of the arid conditions, many drainages are dry or ephemeral; the flows in those drainages are effluent dependent. Therefore, no aquatic life thrives and reproduces in these drainages. Aquatic life may only be present intermittently during high flow conditions. Whole Effluent Toxicity ("WET") testing is conducted to test the toxicity of the discharges to the resident aquatic species. Testing for survivability and reproductivity of aquatic life should occur at the confluences of the drainages and the river where aquatic communities are present. Acute WET testing in the tributaries at the outfalls already provides early indicators of potential problems.

On December 18, 2013, Pioneer filed Permit Modifications requesting modification to the existing Permit Nos. CO-0047776 and CO-0048003 permits to implement "alternative approaches for determining compliance with [WET] chronic testing for outfalls in the Raton Basin." *See* 47776 WET Permit Modification Form; 48003 WET Permit Modification Form at 2; 48003 WET Permit Modification Form at 2 and all supporting documents and data included with these permit modifications. These WET modification requests were encouraged by and developed in cooperation with the EPA. The request explained that "[b]iological monitoring has found that aquatic life communities are only sustained in the Purgatoire River, not the upgradient tributaries," and therefore proposed that "acute WET testing at discharge outfalls in the tributaries will be protective." Sandquist Letter (Dec. 16, 2013).

When measured at the outfall, some of the outfalls could not comply with the required chronic WET testing, which used the species *C. dubia*. This arose, in part because of *C. dubia*'s sensitivity to total dissolved solids ("TDS") compared to other test species, such as *D. magna*.

Pioneer therefore proposed a revised, two-part WET testing approach. First, Pioneer proposed acute WET testing at the outfalls prior to the discharge entering state waters using *D.magna*, which is less susceptible to TDS toxicity and more representative of the aquatic species in the areas. *See* Sandquist Letter (Dec. 16, 2013). Second, to assure that no toxicities other than TDS were affecting aquatic species, there would be chronic WET testing using *C. dubia* at the confluences with the Purgatoire River where aquatic life is found.

However, it appears there is no recognition by the Division of this work and study effort in the Draft Permits. Pioneer takes exception to statements from the draft Fact Sheets that state insufficient work has been completed or data provided. The Division found that, regardless of whether aquatic life actually exist in the relevant watersheds, the WQCC's aquatic life standards for the segmentation applied.

The Division separately rejected the proposal to perform chronic WET testing at the confluences due to its interpretation of Section 25-8-501, C.R.S., and 5 C.C.R. § 1002-61.8(2)(e),which it found to require permit limitations "at outfall locations, prior to entering a state water"(emphasis in original). The Division's rationale for rejecting the proposal is not supported by the law or regulation referenced by the Division. Neither Colo. Rev. Stat. 25-8-501 nor 5 C.C.R. § 1002-61.8(2)(e) requires permit limitations "prior to entering state water." Regulation 61.8(2)(e) only requires limitations, standards and prohibitions to be established for each outfall. It does not dictate that compliance and testing cannot occur downstream. Although discharge permits must include effluent limitations for each permitted outfall or discharge point (*see* 5 C.C.R. § 1002-61.8(2)(e)), neither the WQCA nor the Division's regulations specify that the concentration of a pollutant at the outfall must satisfy the receiving stream's water quality standards where, like here, the discharge is effectively treated further (by dint of its attempted journey across otherwise dry stream beds) before reaching waters where the protected use actually exists.

Response 10: The Division has enhanced the fact sheet language to provide further clarity regarding the regulatory basis and information used to establish WET effluent limits, consideration of the requested revision to the effluent limits proposed by the permittee, and

consideration of establishment of effluent limits for the pollutants causing toxicity, sodium bicarbonate, $NaHCO_3$, and bicarbonate, $HCO3^-$.

The Division agrees with the comment that Whole Effluent Toxicity (WET) testing is an analysis conducted on discharges to evaluate effluent toxicity. WET tests are laboratory experiments using wastewater effluent that are designed to measure the effects *of an effluent* on aquatic life species in regards to the survival, growth, and reproduction of aquatic organisms. Per 40 CFR Part 136 Test Methods, specific organisms are specified and are exposed to differing concentrations of an effluent (i.e. the instream wastewater concentration (IWC), and dilutions series) for specified exposure periods. The responses of the test organisms are used to estimate the toxicity of the *effluent* based on survival, and/or effects on the growth and reproductive ability of the organisms. Thus, limitations for WET functions as controls on wastewater effluent, not instream water, and remain applicable. Note that, Aquatic Toxicity Methods as listed in 40 CFR 136.3 are either; an "LC50, percent effluent" or "IC25, percent effluent" further substantiating the intent of testing on wastewater effluent testing in the permitting framework.

As noted in previous permit modification requests (notably EC and SAR modification requests, 2013), and in numerous discussions, the Division maintains that permit limitations apply at outfall locations, and that instream compliance and instream treatment are not allowable under the permitting framework, and are not commensurate with effluent permitting concepts. Discharge limitations in CDPES permits, including WET testing, are at outfall locations, similar to other parameters like pH and metals. CDPES permits are not intended for instream, ambient waterbody testing. Nowhere in the above cited regulation(s) does it indicate or imply that permit effluent limits are contemplated or appropriate on (in)stream water. Further, dilution for effluent limits (including WET and other parameters) is already incorporated into effluent limits, thus including instream mixing when setting permit limits. This approach is consistent with the permitting framework and associated regulations and was incorporated into the effluent limits for these renewal permits, when available. Thus, instream low flow dilution (mixing) was already considered and applied, where available.

The regulatory requirement to establish *control* of a pollutant via a limitation per the above regulation is not consistent with the permittees proposal to conduct instream chronic toxicity testing, which would only serve to "verify that the toxicant is TDS." Thus, this is not consistent with the purpose of effluent limits as the method for *controlling* (i.e. preventing) instream toxicity.

There are two types of Whole Effluent Toxicity testing requirements, acute and chronic.

Per the *Implementing Narrative Standard for Toxicity in Discharge Permits Using Whole Effluent Toxicity (WET) Testing* Policy. Division Policy Permits-1, September 30, 2010. Hereafter "WET Policy":

> The determination of whether acute or a chronic WET requirements would be applicable in a permit is based on the ratio of the "chronic low flow" to the effluent design flow, where the chronic low flow is the 30E3 as defined in Regulation 31. If this ratio is less than 10:1, chronic WET testing is applied. Conversely, if the ratio is greater than or equal to 10:1, acute WET testing will be applied.

In the WET Policy, there are, however, exemptions from this approach. Each was evaluated by the Division. They are as follows;

> a. WET testing will not be required where there is not an aquatic life designated use on the stream segment, unless such testing is determined to be necessary to protect downstream aquatic life designated uses.

The WQCC adopted aquatic life uses on every segment included in this permitting action. Therefore, this exemption does not apply.

> b. Regardless of the dilution ratio, acute WET testing will be required where there is an aquatic life designated use, but most of the aquatic life standards (e.g. chlorine, and the TVS equations such as ammonia and metals standards) are not in the site-specific segment standards, **unless it is determined that chronic WET testing is necessary to protect downstream aquatic life designated uses, or other evidence exists that would make chronic WET requirements appropriate.**

The Division acknowledges that segment COARLA06a (All tributaries to the Purgatoire River, including all wetlands, from the source to Interstate 25, except for specific listings in segments 4b, 5a, 5b, 5c and 6b.) has an aquatic life designated use without all of the aquatic life standards. Therefore, this exemption (acute WET testing) was considered for several outfalls in the 06a drainages. In the draft permit, Acute WET testing was applied to those discharges that remain solely within segment 06a as a result of flow evaluations conducted by the permittee. Several outfalls within the East Spanish Peaks (CO0047767) permit have acute WET testing as a result of this analysis.

Thus, where a discharge did not flow into a downstream segment with all of the aquatic life standards, acute WET testing was applied *even in cases when the dilution ratio would have indicated chronic WET testing*. Thus, this exception was considered and implemented, where applicable, in the draft permitting action. The exception, however, expressly prohibits applying the exemption from chronic WET testing where the effluent reaches a downstream segment with all of the aquatic life designations. In these permitting actions, if an outfalls within a drainage has the potential to enter a waterbody with all of the aquatic life uses, this exemption was not applied. Further, the Division has evidence that instream locations downstream of the discharge are exhibiting chronic toxicity due to TDS, specifically sodium bicarbonate $NaHCO_3$ and bicarbonate $HCO3^-$ (*Ecological Evaluation of the Effects of XTO and Pioneer NPDES Discharges to the Lorencito and South Fork Purgatoire River,* AECOM, February 2013).

> c. Where the discharge is intermittent, as defined below, acute WET testing may be substituted for chronic WET testing. The basis for this is that there would not be chronic exposure of aquatic life to the effluent.
>
> > A) the maximum discharge frequency is less than 3 consecutive days (72 hours), and less than 3 days per 7 day period, and less than 10 days total per month
> >
> > B) the maximum discharge frequency is less than 5 consecutive days (120 hours) and less than 5 total days per month

C) It can be shown that discharge frequency and duration is tied solely to precipitation events, where the discharge starts and stops shortly after the precipitation event starts/stops.

The Division has received no indication from the permittees that any effluent discharges are intermittent, or that there is any intention to convert discharges to intermittent in order to qualify for acute wet testing. Thus, at this time, this exception is not applicable. Should the permittees elect to discharge in accordance with an "intermittent" designation, acute WET testing will be applied to those outfalls, regardless of their location in the watershed, and the dilution ratio. To clarify, even if a discharge reaches a downstream waterbody with all of the aquatic life standards and chronic WET testing would normally apply, an intermittent discharge would change a chronic WET testing requirement, to an acute WET testing requirement.

The Division's selection of acute or chronic WET testing for all outfalls was based on the entirety of this evaluation at the time of the draft, and subsequent public notice comments.

In this permit renewal, for those discharges to zero low flow canyons and tributaries without all of the aquatic life standards, but which do have the potential to enter a downstream waterbody, the Division re-evaluated its approach to WET testing on the drainages. In this permit, the outfalls to (dry) drainages were considered relative to their dilution to the downstream waterbody in lieu of the low flow condition (dry) on the tributaries, or a flow modeled together. For example, the IWC for a tributary discharge was considered relative to the flow in the downstream waterbody (usually the mainstem of the Purgatoire River) resulting in less stringent IWC. Instead of compliance based on 100% effluent (100 IWC, dry drainages), compliance is now based on the flow of the outfalls on the tributary relative to the Purgatoire, which results in an IWCs where chronic WET is applicable, at less than 50%. Further, with this approach many, but not all, outfalls qualify for acute WET testing.

This means that at an "IC25", the concentration that causes a 25% reduction in reproduction and growth, and a "No observed effect" would be required at less than 50% of wastewater effluent (and 50% of lab water) versus at 100% wastewater. In this permit, if the IC25 and an observed effect are present, but are *above* 50% wastewater, this passes the chronic WET test.

For the Lorencito watershed, the low flow is zero, and chronic WET testing remains applicable at 100% effluent (IWC = 100). This is not a change from the previous permit. Chronic WET testing with a compliance schedule at 100 IWC was applied in the last (current) permit.

Specific changes, corrections, and edits are discussed for each permit below:

The Lorencito Watershed, XTO-CO0048054 (39 outfalls), Pioneer-CO0047776 (7 outfalls)

For the XTO outfalls that discharge to tributaries to or directly to Lorencito Canyon (CO0048054) and Pioneer outfalls that discharge to tributaries to and directly to Lorencito Canyon (CO0047776), the IWC is at 100% based on the zero low flow of Lorencito Canyon, which indicates that chronic WET testing is required. The permittees comment that because most of these outfalls are discharging to surface water bodies under COARLA06a (tributaries)

and considering COARLA06a only has an abbreviated set of aquatic life standards applied to the segment, only outfalls directly discharging to COARLA04b (Lorencito Canyon) should be subject to chronic WET testing.

As discussed above, the Division considers discharges for all receiving waterbodies, whether direct or indirect (i.e downstream). Thus, any discharges that have the potential to reach the Lorencito, have the uses and standards associated with the Lorencito applied.

Note that this is no change from the previous permit, which also applied chronic WET testing at 100% to these outfalls.

XTO Alamosito/Apache Canyon, CO0048062

The Division re-evaluated the calculations for the 38 outfalls for this facility. In some instances the IWC's have been changed, which in some cases changes the WET testing type (chronic vs acute). The modified IWC's are due either to; the reassignment of receiving water based on new information; or a typographical error during the writing of this permit. Specific outfalls and canyons are discussed below;

Ciruela and Lopez Canyons

Outfall 036-G was originally designated as discharging to Ciruela Canyon, however the permittee submitted a correction that 036-G discharges to Lopez Canyon, not Ciruela Canyon. Based on this new information, the IWCs for the outfalls associated with both Ciruela Canyon (where effluent flow is removed) and Lopez Canyon (where effluent flow is added) has changed per below.

Ciruela Canyon – COARLA06a/COARLA05a			**Public Notice Version of Draft Permit**
015G, 016G, 037G, 038G, 042G	0.28	3% - ACUTE	015G, 016G, 036G, 037G, 038G 44% = Chronic
Lopez Canyon– COARLA06a/COARLA05a			**Public Notice Version of Draft Permit**
027-G, 033-G, 036G	0.51	5% - ACUTE	027-G, 033-G 3%= Acute

All outfalls associated with Cirula Canyon have changed from chronic WET testing to acute WET testing. For Lopez Canyon, acute WET testing remains applicable.

As a result of these revisions, outfalls on Ciruela Canyon (015G, 016G, 037G, 038G, 042G) no longer qualify for a compliance schedule as the WET testing requirements have become more lenient, and the permittee is able to meet the limitations (100% IWC acute WET testing to 3% IWC acute WET testing). Therefore, the compliance schedules for chronic WET testing has been removed from the permit for 015G, 016G, 037G, 038G, 042G.

Gallegos Canyon (Outfalls 079-H and 080H)
A typographical error was noted in the IWC calculation and this has been corrected. The IWC in the draft permit was 40%, but should have been listed as 30%.

IWC = [Facility Flow (FF)/(Stream Chronic Low Flow (annual) + FF)] X 100%
IWC = [Effluent flow (0.28 cfs)/0.5 cfs South Fork + 0.28 cfs)] x 100%

Thus, the IWC has become less stringent from an IWC of 40% to an IWC of 30%.

Alamocito Canyon (Outfalls 014A, 017A, 032A, 033A, 016A, 018A)
A typographical error was noted in the IWC calculation and this has been corrected. The IWC in the draft permit was 20%, but should have been listed as 44 %.

IWC = [Facility Flow (FF)/(Stream Chronic Low Flow (annual) + FF)] X 100%
IWC = [Effluent flow (0.39 cfs)/0.5 cfs South Fork + 0.39 cfs)] x 100%

Thus, the IWC has become more stringent from an IWC of 20% to an IWC of 44%.
Chronic WET remains applicable for these six outfalls.

Apache Canyon (Outfalls 001G, 007G, 021G, 028G, 004G, 060A)
A typographical error was noted in the IWC calculation and this has been corrected. The IWC in the draft permit was 15% (chronic) but should have been listed as 4 %.

IWC = [Facility Flow (FF)/(Stream Chronic Low Flow (annual) + FF)] X 100%
IWC = [Effluent flow (0.46 cfs)/11 cfs Purgatoire+ 0.46 cfs)] x 100%

All outfalls associated with Apache Canyon have changed from chronic WET testing to acute WET testing.

As a result of these revisions, outfalls on Apache Canyon no longer qualify for a compliance schedule as the WET testing requirements have become more lenient, and the permittee is able to meet the limitations. Therefore, the compliance schedules for chronic WET testing has been removed from the permit for 001G, 007G, 021G, 028G, 004G, 060A).

All outfalls, including those with the revised IWC's are listed in the WQA.

CO0048003:
As Parras Canyon is a zero flow stream, the IWC calculated must be 100%, which results in chronic WET testing. Parras Canyon is under segment COARLA05b and COARLA05b is assigned the full suite of aquatic life standards. Therefore outfalls 005 and 245 must have chronic WET testing at 100% IWC assigned. The standards are adopted by the WQCC and the Permits Section is responsible for implementation.

For outfall 241, which was originally listed as discharging directly to Guajatoyah Creek, the permittee indicated that the outfall actually discharges to an unnamed tributary to Guajatoyah Creek. The unnamed tributary is a zero flow stream and therefore significantly changes the IWC. The unnamed tributary is still classified as under stream segment of COARLA05a: "**Mainstem of the North Fork of the Purgatoire River, including all tributaries and wetlands, from the source to a point immediately below the confluence with Guajatoyah Creek**; mainstem of the Middle Fork of the Purgatoire River, including all tributaries and wetlands, from the source to

the Bar Ni Ranch Road at Stonewall Gap; Mainstem of the South Fork of the Purgatoire River, including all tributaries and wetlands, from the source to Tercio." All aquatic life standards are assigned and considering the receiving stream is a zero flow stream, outfall 241 will now have an IWC of 100% chronic (instead of 53%, which was the IWC listed in the draft permitting documents.)

CO0047767:

The Division re-evaluated the calculations for the outfalls for this facility. Those outfalls on Burro Canyon had a miscalculated IWC at 5%; the correct IWC is 3%, which still indicates acute WET testing requirements.

List of OutfallsFlows (cfs), Receiving Streams, and IWC			
Outfalls	Total Contributing Flow (cfs)	New IWC	Previous permit limit
Burro Canyon – COARLA06a Chronic Low Flow for the Purgatoire River = 11 cfs			
079-A, 160-A, 183-A, 220-A, 221-A	0.332	3% - ACUTE (was 5% in draft permit)	100% - ACUTE
Reilly Canyon– COARLA06a Chronic Low Flow for the Purgatoire River = 11 cfs			
057-A, 060-A, 065-A, 094-A, 202-A, 230-A	2.19	17% - CHRONIC	100% - ACUTE
Santisteven Canyon– COARLA06a Chronic Low Flow for the Purgatoire River = 11 cfs			
004-A	0.749	6% - ACUTE	100% - ACUTE
Sarcillo Canyon– COARLA06a Chronic Low Flow for the Purgatoire River = 11 cfs In order for flows to Sarcillo Canyon to qualify for acute WET testing, the combined flows to the canyon must be at 0.71 MGD/1.1 cfs or less			
075-A, 096-A, 105-A, 147-A, 156-A, 228-A, 238-A, 239-A	1.45	12% - CHRONIC	100% - ACUTE
Smith Canyon– COARLA06a Chronic Low Flow for the Purgatoire River = 11 cfs			
215-A	0.074	1% - ACUTE	100% - ACUTE
Unnamed Tributary to Purgatoire River – COARLA06a Chronic Low Flow for the Purgatoire River = 11 cfs			
007-A	0.67	6% - ACUTE	100% - ACUTE
073-A	0.05	0.5% - ACUTE	100% - ACUTE
217-A	0.51	4% - ACUTE	100% - ACUTE

***SARCILLO CANYON ACUTE WET**

NOTE THAT A REDUCTION IN PERMITTED FLOW TO 1.1 cfs WOULD RESULT IN ACUTE WET TESTING FOR ALL 8 OUTFALLS IN SARCILLO CANYON

Comment 11: The Draft Permits change the WET testing species with no explanation. The Draft Permits contain contradictory requirements regarding what constitutes a failed acute WET test.

Response 11: For acute WET testing, the Division inadvertently omitted the species changed to *Daphnia magna* on some outfalls. The WET testing species for those outfalls assigned with acute WET, has been revised to require *Daphnia magna* in lieu of *Ceriodaphnia.* For acute testing the Division clarified the permit language regarding what constitutes a failure.

Comment 12: Despite new WET testing requirements, the Draft Permits do not provide adequate compliance schedules.
The Draft Permits contain many WET testing changes that are completely different and contrary to the significant WET data provided under the current permit and historical practices found in previous permits. For example, the Draft Permit requires a different species (*C. dubia*) for acute testing, testing frequency has been increased substantially from annually to quarterly, IWC concentrations have been changed, the calculation used to determine whether a chronic test passes (it now includes reproduction) and, more importantly, chronic testing requirements have been imposed instead of acute. The Division should have provided XTO with a compliance schedule for these broad and sweeping changes – any one of which warranted a compliance schedule. The Division also reduced compliance schedules in some cases. For example, in the case of WET testing, the Division suggested that ample time has been provided in the prior permit term to come into compliance, when in fact the proposed WET limits are different from the previous permits, new and not warranted, and erroneous. Due to the significant changes in the limits, test species, etc., the proposed WET testing limits necessitate an extended compliance schedule of four years minimum. 5 C.C.R. § 1002-31.14(4) and 1002-61.8; *see also* WQCD, Permit Compliance Schedules, Clean Water Policy No. 3 (March 4, 2014).

Response 12: Please see response to comment 5. The Division must require compliance "as soon as possible" and cannot include time for steps that have already been completed under the previous permit. For WET, examples include time to identify the toxicant, and time to evaluate control alternatives. These steps have been completed. For WET, the Division has determined that additional time is not needed for the permittee to determine their ability to comply. As noted in these responses to comments, for acute WET testing, the Division inadvertently omitted the species changed to Daphnia magna on some outfalls and this has been revised in the permit. For chronic WET, the Division has reviewed the testing results at various dilution ratios to determine the ability of the outfalls to comply at the IWCs calculated for this permit renewal. In this review the Division found that the thresholds where significant increases in toxicity were observed were clear, and that the information was adequate to inform the ability for that outfall to comply with the effluent limit.

Comment 13: The Draft Permits impose 100% Acute WET testing for outfalls that discharge to dry reaches. The WQA, Fact Sheet, and Draft Permit Language in the Permits are in error and inconsistent regarding WET requirements.

Outfalls that discharge to dry arroyos and do not support aquatic communities should not require any WET testing. The Draft Permits erroneously requires acute WET testing for some outfalls that discharge to dry arroyos.

Response 13: The "dry arroyos" are under segment standard COARLA06a, which has an aquatic life use classification assigned. The Division evaluates both the segment to which the outfall discharges directly, and any downstream segments affected by the discharge. If either of these waterbodies has been assigned the aquatic life use classification, the Division includes permit limits to support all assigned uses. Aquatic species, even if limited in scope, will be living in 100% effluent, and therefore WET is appropriate. The division has enhanced the discussion in the fact sheet regarding WET.

Comment 14: The Draft Permits arbitrarily increase WET testing frequency from once per year to quarterly. The proposed WET testing requirements are economically unreasonable.

The Division has not considered the technical and economic feasibility of conducting hundreds of chronic WET tests on the quarterly schedule outlined in the Draft Permits. The Division has not consulted with commercial laboratories available to the companies to determine the feasibility of meeting such a demanding schedule, nor did it consult with field personnel who have decades of experience collecting such samples to see if it was even physically possible.

Because each WET test requires the collection of multiple field samples at remote locations hundreds of miles from any available laboratory, the requirement has a high probability of being logistically infeasible. Had the Division evaluated the real-world implications of such a testing schedule, it would not have accelerated the WET testing frequency from annually to quarterly.

To date, over five years of WET data has been compiled along with the special investigations to support the Companies' requests for WET permit modifications. The historic data shows consistent, predictable WET results – no increase in testing is warranted. The Division retains the authority to vary the frequency as warranted by site-specific circumstances, and the Companies have collected an abundance of data which should be taken into consideration to reduce monitoring frequency, not increase it. The monitoring frequency should not increase at this juncture and should remain an annual requirement.

Furthermore, the Draft Permits specify that "failure to obtain a valid test result during a monitoring period [e.g., quarterly, in the case of WET], shall result in a violation of the permit for failure to monitor." Draft 47767 Permit at 26; Draft 47776 Permit at 15; Draft 48003 Permit. This requirement, and potential violation, could result even if, due to weather, snow cover and the remote location of the outfall, it is neither feasible not safe to collect WET samples

Response 14: The Division disagrees that the WET frequency included in the draft permit was determined "arbitrarily." Nevertheless, regardless of "consistent" results, monitoring frequencies assigned in a permit are not based on, or result from "consistency." Rather, monitoring frequencies are adopted commensurate with the Division's Clean Water Permitting Policy 21 "Whole Effluent Toxicity (WET) Testing Policy" ("WET policy").

Per the WET policy, the standard monitoring frequency is quarterly, and therefore the Division applied the standard quarterly monitoring frequency. While the WET policy does indicate that the Division retains the authority to vary the frequency, the criteria for varying monitoring frequency is as follows;

> WET testing shall normally be required on a quarterly basis, although the Division retains authority to vary the frequency as warranted by site-specific circumstances. For instance, frequency may be increased to monthly where there have been instances of WET failures

Because failures of chronic whole effluent toxicity have occurred throughout the permit term, no reduction in chronic WET testing from the standard monitoring frequency is warranted at this time. Thus, quarterly WET testing remains applicable where chronic WET applies. However, the Division reconsidered the monitoring frequency for acute WET testing. Based upon a review of the acute WET testing results, and compliance with the acute WET limitation in the vast majority of outfalls, the Division determined that a reduction in acute WET testing is warranted. The permit has been modified to semi-annual acute WET monitoring in lieu of quarterly acute monitoring for the following outfalls.

The Division understands there can be situations where events preclude sample collection and reporting. The permitting and compliance framework in place adequately addresses these situations.

For any instance where sample results are not available to be reported, the permittee should submit their DMR with either partial results for the reporting period, or a blank DMR if sample results are not available for the entire reporting period, with additional information to document the circumstances. The details are provided in Part II.3 of the permit which states the following:

> c. Unless otherwise indicated in this permit, the permittee shall report instances of non-compliance which are not required to be reported within 24-hours at the time Discharge Monitoring Reports are submitted. The reports shall contain the information listed in sub-paragraph (a) of this section.
>
> a. If, for any reason, the permittee does not comply with or will be unable to comply with any discharge limitations or standards specified in this permit, the permittee shall, at a minimum, provide the Division with the following information:
> i) A description of the noncompliance and its cause;
> ii) The period of noncompliance, including exact dates and times and/or the anticipated time when the discharge will return to compliance; and
> iii) Steps being taken to reduce, eliminate, and prevent recurrence of the noncomplying discharge.

The process established in the compliance framework includes a review of the information submitted with the DMR to determine the appropriate characterization of the incident, including whether the incident was beyond the reasonable means of the permittee and therefore warrants resolution. When the Division determines that resolution is appropriate, the Division uses tools available through EPA's ICIS database to characterize the incident through the assignment of a

No Data Indicator Code (NODI). For example, a NODI code of "V" indicates that the incident was "weather related" and when the code is assigned the incident is resolved. A complete list of NODI codes is available on EPA's web site. This process allows each unique incident to be appropriately characterized.

XTO and Pioneer: Comments on Iron

Iron Trading

Comment 15: Iron at Historic High Levels

Water quality data collected by USGS (1978 -1981) and Tetra Tech (April 2010 to December 2014) demonstrate that the Purgatoire Watershed produces and transports very high volumes of sediment (as measured by TSS) and associated iron. The monitoring network design implemented by Tetra Tech April 2010 through December 2014 included 27 stations that were monitored monthly and nine monitoring sites which continuously recorded data near real-time (Figure XIII-1). Three Purgatoire River monitoring sites [North Fork Purgatoire-5.2 (NFPR-5.2), Middle Fork Purgatoire-37.1 (PR-37.1), and South Fork Purgatoire 12.7 (SFPR-12.7)] are upstream of CBM outfalls and represent ambient water quality entering the basin. A variety of water quality parameters were measured at these three upstream locations, including total recoverable iron (Fe_{TR}) and TSS. This data has been made available to the Division and the public. Summary statistics for the iron and TSS data collected from these three stations since April 2010 are provided in Table XIII-1.

While the upper basins of the Purgatoire River watershed can produce water containing high concentrations of TSS and iron, this is particularly true of the upper South Fork basin. Following on discussions with the Division's Permit Section which started as early as 2012/2013, Pioneer proposed a system to reduce iron from streambank erosion (Iron Trading Program in the Purgatoire Watershed, December 2013), a significant contributor of iron in the Purgatoire River. Water quality upstream of the outfalls indicates that the Purgatoire Watershed produces and transports very high volumes of sediment and associated iron. The Companies proposed a system to reduce iron from streambank erosion (significant contributor of iron in the Purgatoire River.) It continues to be technically and economically infeasible to treat produced water to attain the iron limits. Additionally, The Division has provided no basis for imposing iron standards anywhere other than Lorencito Canyon.

The Division rejected this proposal in the Draft Permits and instead proposed iron limits that, in 2017, will be more than three times as strict as those currently in effect. *See* 47767 Fact Sheet at 12; 47776 Fact Sheet at 10; 48003 Fact Sheet at 10. In proposing these limits, the Division suggested an alternatives analysis to request relief based on the socioeconomic impacts, and the technological or economic infeasibility of meeting these effluent limits. *See* WQA at 88; 47767 Fact Sheet at 18; Draft 47776 Permit at 24; Draft 48003 Permit at 19. Ratcheting down the end-of-pipe discharges limits for total recoverable iron will result in loss of the water resource and economic impacts in a community already challenged by a downturned economy. Moreover, there is no positive environmental impact, as iron sources are overwhelmed by the primary sources of iron discharged into the Purgatoire, TSS, erosion, and stormwater runoff from wildlife areas.

Response 15: The Division acknowledges that the Companies' have done extensive research in evaluating loading trends for total recoverable iron for erosion and the suspended load from the banks of specific areas within the Purgatoire Watershed during times of high flow. The Division has conducted a review of that research and the associated data. The Division reiterates that an Iron Trading Program can be effective and agrees that streambank stabilization may be a viable method to control ambient iron in certain situations, thereby reducing the overall loading of iron in the Watershed.

However, the implementation of pollutant trading in a discharge permit must be commensurate with the guidelines and principals outlined and discussed in the Colorado Pollutant Trading Policy (WQCD, October 2004. The proposal, as submitted was not commensurate with this policy for the reasons outlined in Section III of the Fact Sheets. The Policy specifically prohibits trading that would cause or contribute to an exceedence of a standard. That is, a trading program must be implemented in a way that does not authorize or allow an excursion of the applicable water quality standards (i.e. "hotspots") in *any* stretches of the receiving waters. The waterbody must retain zones for aquatic life passage, and a localized impairment in an area is not the purpose or intent of a trading program. Restoration should function to enhance areas upstream of discharge locations to create assimilative capacity for use by the downstream discharges. Thus, trading is not possible or contemplated where ambient low flows are zero (dry), as the effluent, in parts of the year, is the sole water where aquatic life live, grow, and reproduce, and there is no dilution available. This is the case in Lorencito Canyon (and its tributaries where discharges reach the canyon), where much of the trading was proposed. Therefore, the Division cannot adopt this approach in a discharge permit, and is clarifying that iron trading is not applicable for zero low flow streams.

Further, the proposal evaluated only one area, on the lower stretch of the South Fork, which was either downstream of the majority of discharges on the South Fork, or is in a different "watershed" from those areas where the trading was proposed (i.e. The Lorencito). For that reason, the Division cannot adopt this approach in a discharge permit, as submitted.

However, an iron trading concept remains viable in specific areas, particularly the upper reaches of the South Fork River and, potentially, the upper reaches of the Purgatoire River where there are perennial flows and the restoration is located above facility discharge locations. Upstream restoration should function to reduce upstream ambient concentrations of iron, thus reducing the "capacity" used by ambient conditions, (M_1), and increasing the WQBEL as shown in the mass balance equation below.

$$M_2 = \frac{M_3 Q_3 - M_1 Q_1}{Q_2}$$

Where,

Q_1 = Upstream low flow (1E3 or 30E3)
Q_2 = Average daily effluent flow (design capacity)
Q_3 = Downstream flow ($Q_1 + Q_2$)
M_1 = In-stream background pollutant concentrations at the existing quality
M_2 = Calculated WQBEL

M_3 = Water Quality Standard, or other maximum allowable pollutant concentration

The goal of upstream restoration would be to create assimilative capacity, and subsequently to increase the calculated WQBEL, M_2 . This value would be the new effluent limitation for discharges downstream of the restoration.

Note that the Division reviewed the ambient water quality used for the Purgatoire River for total recoverable iron. The 50th percentile of the ambient water quality, which is the number used in the mass balance equation was 200 ug/l, resulting in a WQBEL of 1649 ug/l. If restoration projects are implemented on the Purgatoire that create assimilative capacity such that (in the best case scenario) the upstream ambient water concentration of total recoverable iron is 0 ug/l, the resulting WQBEL for total recoverable iron would increase to 1812 ug/l (hereafter "alternate WQBEL"). Thus, with the current volume of operations, the maximum alternative WQBEL that a streambank stabilization project could provide on the Purgatoire River would be 1812 ug/l, assuming the project would result in a zero upstream ambient total recoverable iron concentration. Therefore, even with as much assimilative capacity a streambank stabilization could provide for the Purgatoire River, some outfalls would still remain above the "alternate WQBEL." For the South Fork, if the upstream ambient water concentration of total recoverable iron is 0 ug/l, the resulting WQBEL for total recoverable iron would increase to 1358 ug/l ("alternate WQBEL") instead of the current effluent limitation of 1308 ug/l.

Nevertheless, the Division encourages the implementation of any streambank stabilization project to enhance the watershed, even if these projects do not result in direct permit adjustments. Should the permitee elect to pursue restoration projects solely for discharge permit limit adjustments, locations upstream of discharges, on perennial streams, should be selected.

The Division is obligated to apply WQCC promulgated standards to all receiving waters, and notes that the effluent limitations for the Lorencito basin were reduced as a result of the WQCC hearing held in 2013. The permitting framework implements current standards and has no regulatory authority to change these standards. In the Lorencito basin, due to its zero low flow status, the standards assigned to the basin are equivalent to the WQBELs. For these permit limits to change, the companies must pursue a change in the standards for total recoverable iron via a WQCC hearing.

A total recoverable iron standard, although not expressly assigned to COARLA06a, remains applicable to outfalls on this segment *if* the effluent has the potential to reach a waterbody with an assigned total recoverable iron standard. An iron standard is assigned to COARLA05a, COARLA05b, and COARLA04b. Thus, to clarify, if an effluent reaches one of these waterbodies, all of the standards associated with that waterbody are applied including iron (with dilution considerations, if available). If any outfalls do not have the potential to reach the downstream segment, then the total recoverable iron limitations are not required.

Comment 16: Alternatives Analysis for Iron

The Companies informed the Division throughout the permit renewals and compliance reports that attainment of the iron limits was neither technologically or economically feasible.
The Companies have prepared an Alternatives Analysis for Iron Limits and requests that the

Renewed Permits contain iron limits as determined, and specifically proscribed, in the Alternatives Analysis for each outfall.

See Alternatives Analysis for Iron included as Attachment B. (Portions Copied herein)

The Division provided compliance schedules in the existing permits for the Companies to evaluate and develop plans to attain the iron limits and data collected during the compliance schedule indicate that the two-year average iron limit cannot be regularly attained at nearly every outfall, nor can the 30-day limit in some instances. In developing the iron limits, the Division did not consider the socioeconomic impacts nor the technological or economic feasibility of meeting these effluent limits. Therefore, the Companies are requesting that their final discharge permits be modified for iron and the iron limits be determined as set forth in this Alternative Analysis.

The criteria and process for alternatives analysis for unclassified waters are set forth in the regulations:

> An intermediate level of water quality protection applies to waters that have not been designated outstanding waters or use-protected waters. These waters shall be maintained and protected at their existing quality unless it is determined that allowing lower water quality is necessary to accommodate important economic or social development in the area in which the waters are located. For these waters, no degradation is allowed unless deemed appropriate following an antidegradation review in accordance with section 31.8(3).5 C.C.R. § 1002-31.8(1)(b).

ALTERNATIVES ANALYSIS

A. Basis of Alternatives Analysis

According to the Basic Surface Water Quality Standards (5 C.C.R. § 1002-31), if a discharge is related to important economic or social development, a determination is then made regarding whether the degradation that would result from such discharges is necessary to accommodate that development. The degradation may be deemed necessary where there are no water quality control alternatives that are determined to be economically, environmentally and technologically reasonable. Considering these broad directions and individual regulatory factors, the Companies set forth in this submittal their alternatives analysis as it pertains to iron.

31.8(3)(d)(iii) Is Degradation Necessary to Accommodate the Development.

Continued levels of iron discharge to the watershed are necessary to accommodate CBM development in Las Animas County. It is not technologically feasible to produce CBM gas without producing water; nor is it economically feasible to treat produced water or socioeconomically feasible or desirable to dispose of all produced water via subsurface injection. The 30-day iron limits

necessary to accommodate this development at the existing points of discharge on tributaries to the Purgatoire River are outlined in Table 7.
(Copied herein under each permit, respectively).

The permits should be revised to include the 30-day average iron limits as set forth below in Table 7. These limits would provide iron levels below the historical background iron concentrate for this watershed.

Response 16: The Division has evaluated the associated Alternative Analysis for Iron. Note that an AA is designed to evaluate and determine the necessity of the degradation of receiving waters;

> Antidegradation guidance (Part II.D) *"If the impacts are determined to be significant, this does not necessarily mean that the new or increased discharge will not be allowed. Rather, it means the permittee must determine whether degradation is "necessary," including an evaluation of alternatives.".*

Thus, an AA evaluation applies to *degradation* of receiving waters, but does not apply to *beneficial uses* of receiving waters. An AA, and alternate limitations for antidegradation (ADBEL) means that a facility may be allowed to discharge with some degradation to state waters. It does not allow, or function to authorize, changes to standards (and limits) associated with beneficial uses. Limitations for antidegradation are implemented as a 2 year rolling average in the renewal permit, while the limitation associated with protection of the beneficial use is implemented as a 30 day average. Because the comment asks for a revision of 30 day average limitations subsequent to the AA, the Division reminds the commenter that the WQCC is the sole authority on standards for the protection of beneficial uses, including the standards for iron. An Alternatives Analysis is not intended or applicable for these standards. As such, an AA is irrelevant for the 30 day average limitations and is not further considered or discussed in that context.

The AA analysis, and associated proposed ADBELs have been considered for the total recoverable 2 year rolling average limitations in each draft permit as discussed separately below.

Note that Part II.F.8 of the Antidegradation Policy states *"The permittee may **elect to accept** the ADBAC (which would result in insignificant degradation) along with the WQBELnew, or may pursue **less stringent** **(emphasis added)** limits by completing the antidegradation review including alternatives analysis." Regulation 31.8(3)(d)(III) "The degradation shall be considered necessary if there are no water quality control alternatives available that (A) would result in no degradation or less degradation of the state waters and (B) are determined to be economically, environmentally, and technologically reasonable.".*

Note that many of the outfalls in the AA propose ADBELs larger than the 495 mg/l (or the associated ADBAC). Therefore, when applicable in these situations, the new WQBEL is protective of the AD limitation. The AD guidance allows assigning "*ADBEL<= WQBELnew"*

when a degradation is necessary and there is no less degrading alternatives available. Therefore, the Division determined that a less stringent limitation is appropriate for these outfalls.

In the AA, the companies provided tables for each permit (CO0047767, CO0047776, CO0048003, CO0048054, and CO0048062), and each outfall with proposed limitations for iron. However, no evaluation or basis for these numbers is included in the AA. Thus, the Division is unsure of the methodology used to derive the suggested limits. Nevertheless, because alternative antidegradation-based limitations are based upon a demonstration of the *necessity* of degradation as discussed above, the Division implemented the maximum 2 year rolling average exhibited during the previous permit term at each outfall, in lieu of some the proposed suggested limitations. The Division determined that the maximum effluent 2 year average meets the demonstration of a *necessary* level of degradation. Anything beyond current effluent concentrations does not meet the threshold of a demonstration of necessity, and is not further considered.

Pioneer East Spanish Peaks- CO0047767

The Table below is from page 27 of the Alternatives Analysis for total recoverable iron. Note that the Division assumes the "Pioneer Proposed" limits are the proposed ADBELs).

(from Table 7-B, page 27 of the Alternatives Analysis)

Permit No. CO-0047767			
Outfall	**Pioneer Proposed Fe_{TR} Limits (µg/L)**	**WQCD Draft 30-day Avg. Fe_{TR} Limits (µg/L)[1]**	**WQCD Draft 2-year Avg. Fe_{TR} Limits (µg/L)[1]**
230	560	1649[2]	495[2]
075	1400	1649[2]	495[2]
007	760	1649[2]	495[2]
217	960	1649[2]	495[2]
004	600	1649[2]	495[2]
228	610	1649[2]	495[2]
202	1000	1649	495
147	1100	1649	495
094	1300	1649	495
160	2600	1649	495
073	950	1649	495
065	2800	1649	495
079	990	1649	495
221	2700	1649	495
057	1000	1649	495
156	2700	1649	495
096	1100	1649	495
183	1800	1649	495
060	2600	1649	495
215	2700	1649	495
238	3000	1649	495
220	1700	1649	495

239	2500	1649	495
105	2100	1649	495

[1]Fe, TR (µg/L), starting Jan. 1, 2017.

[2] No compliance schedule; effective immediately upon permit issuance.

Outfalls 004-A, 007-A, 075-A, 202-A, 217-A, 230-A

For 004-A, 007-A, 075-A, 202-A, 217-A, 230-A, previous monitoring indicate that the ADBAC can be met and therefore, since the facility can meet the limitations in the draft permit, the demonstration has not been made that (new) degradation is necessary. Thus, because this threshold has not been met, the proposed ADBELs for these outfalls are not further considered. No changes to the ADBACs have been made.

Outfalls 057-A, 073A, 079A, 094A, 096A, 147A, 183A, and 228A 060-A, 065-A, 105-A, 156A, 160A, 215A, 220A, 221A, 238A

The 2 year rolling average maximum effluent concentrations for these outfalls is less than the WQBEL. Therefore, the WQBEL will not be protective of the necessary level of degradation and the ADBELs will be revised from 495 ug/l to the highest effluent value as follows;

Permit No. CO-0047767				
Outfall	**Pioneer Proposed FeTR Limits (µg/L)**	**WQCD Draft 30-day Avg. FeTR Limits (µg/L)[1]**	**WQCD Draft 2-year Avg. FeTR Limits (µg/L)[1]**	**ADOPTED ADBEL (Highest Effluent 2 Yr)**
228	610	1649[2]	495[2]	**567**
147	1100	1649	495	**616**
094	1300	1649	495	**643**
160	2600	1649	495	**970**
073	950	1649	495	**596**
065	2800	1649	495	**810**
079	990	1649	495	**773**
221	2700	1649	495	**811**
057	1000	1649	495	**740**
156	2700	1649	495	**1096**
096	1100	1649	495	**750**
183	1800	1649	495	**1108**
060	2600	1649	495	**771**
215	2700	1649	495	**804**
238	3000	1649	495	**1381**
105	2100	1649	495	**1353**

Outfall 220A and 239A

220A- Outfall 2 year rolling averages have been as high as 1,914 ug/l, and Pioneer proposed an ADBEL of 1,700 ug/l. Thus, because the effluent is greater than the WQBEL, the Division will set the ADBEL equal to the WQBEL, considering the WQBEL would

therefore be protective of the ADBEL as the maximum 2 year effluent has exceeded that value. For this outfall, the 2 year rolling average for total recoverable iron has been removed from the permit. The 30 day average iron limitation of 1,649 ug/l is the sole iron limitation.

239A-- Outfall 2 year rolling averages have been as high as 1,800 ug/l, and Pioneer proposed an ADBEL of 2,500 ug/l. Thus, because the effluent is greater than the WQBEL, the Division will set the ADBEL equal to the WQBEL, considering the WQBEL would therefore be protective of the ADBEL as the maximum 2 year effluent has exceeded that value. For this outfall, the 2 year rolling average for total recoverable iron has been removed from the permit. The 30 day average iron limitation of 1,649 ug/l is the sole iron limitation.

Pioneer Lorencito- CO0047776

The Table below is from the Alternatives Analysis for total recoverable iron. Note that the Division assumes the "Pioneer Proposed" limits are the proposed ADBELs.

(From Table 7-B, page 27 of the Alternatives Analysis)

Permit No. CO-0047776			
Outfall	**Pioneer Proposed Fe_{TR} Limits (µg/L)**	**WQCD Draft 30-day Avg. Fe_{TR} Limits (µg/L)[1]**	**WQCD Draft 2-year Avg. Fe_{TR} Limits (µg/L)[1]**
076	510	1000[2]	495[2]
027	1300	1000	495
005	1400	1000	495
022	1400	1000	495

Outfalls 010, 059, and 075

Previous monitoring indicates that the renewal permit WQBEL and ADBAC can be met. Since the facility can meet the limitations in the draft permit, the demonstration has not been made that (new) degradation is necessary. Thus, because this threshold has not been met, the proposed ADBELs for these outfalls are not further considered. No changes to the ADBACs have been made.

076A

A 2 year rolling average was not applicable during the last permit term due to the previous status of not flowing to the Purgatoire River. Thus, the Division calculated the 2 year rolling averages, and concurs with the permittee that this outfall may not meet the current ADBAC. Thus, an ADBEL is warranted, and the Division has adopted the "proposed limit" of 510 ug/l above. The permit has been changed to incorporate this ADBAL.

Outfalls 005, 022, and 027

The 2 year rolling average maximum effluent concentrations for these outfalls is less than the WQBEL. Therefore, the WQBEL will not be protective of the necessary level of degradation and the ADBELs will be revised from 495 ug/l to the highest effluent value as follows;

Permit No. CO-0047776				
Outfall	**Pioneer Proposed Fe_{TR} Limits (µg/L)**	**WQCD Draft 30-day Avg. Fe_{TR} Limits (µg/L)**	**WQCD Draft 2-year Avg. Fe_{TR} Limits (µg/L)**	**ADOPTED ADBEL**
076	510	1000	495	**510**
027	1300	1000	495	**744**
005	1400	1000	495	**890**
022	1400	1000	495	**829**

Pioneer West Spanish Peaks CO0048003

The Table below is from the Alternatives Analysis for total recoverable iron. Note that the Division assumes the "Pioneer Proposed" limits are the proposed ADBELs.

Permit No. CO-0048003			
Outfall	**Pioneer Proposed Fe_{TR} Limits (µg/L)**	**WQCD Draft 30-day Avg. Fe_{TR} Limits (µg/L)**	**WQCD Draft 2-year Avg. Fe_{TR} Limits (µg/L)**
241	970	Report	**Report**
005	920	1000	**363**
245	1300	1000	**363**

Outfall 241
Previous monitoring indicates that the renewal permit WQBEL and ADBAC can be met. Since the facility can meet the limitations in the draft permit, the demonstration has not been made that (new) degradation is necessary. Thus, because this threshold has not been met, the proposed ADBELs for these outfalls are not further considered. No changes have been made. Note that the current 2 year average is a "report" only.

Outfalls 005 and 245
The 2 year rolling average maximum effluent concentrations for these outfalls is less than the WQBEL. Therefore, the WQBEL will not be protective of the necessary level of degradation and the ADBELs will be revised from 495 ug/l to the highest effluent value as follows;

Permit No. CO-0048003				
Outfall	**Pioneer Proposed Fe_{TR} Limits (µg/L)**	**WQCD Draft 30-day Avg. Fe_{TR} Limits (µg/L)**	**WQCD Draft 2-year Avg. Fe_{TR} Limits (µg/L)**	**ADOPTED ADBEL**
241	970	Report	Report	**Report**
005	920	1000	363	**920**

245	1300	1000	363	**690**

Outfall 005- Note that Pioneer proposed an ADBEL of 920 ug/l, and the Division concurs that the 2 year rolling averages have been as high as this value. Therefore, the Division will set the ADBEL equal to the proposed limitation of 920 ug/l.

XTO ALAMOSITO CO0048062

The Table below is from the Alternatives Analysis for total recoverable iron. Note that the Division assumes the "XTO Proposed" limits are the proposed ADBELs.

(from Table 7-A, page 25-26 of the Alternatives Analysis)

Permit No. CO-0048062							
Outfall	**XTO Proposed Fe TR Limits (µg/L)**	**WQCD Draft 30-day Avg. Fe TR Limits (µg/L)[1]**	**WQCD Draft 2-year Avg. Fe TR Limits (µg/L)[1]**	**Outfall**	**XTO Proposed Fe TR Limits (µg/L)**	**WQCD Draft 30-day Avg. Fe TR Limits (µg/L)[1]**	**WQCD Draft 2-year Avg. Fe TR Limits (µg/L)[1]**
001A	2800	1308	366	**002G**	2520	1649	495
016A	1640	1308[2]	366[2]	**004G**	1820	1649	495
017A	1380	1308[2]	366[2]	**006G**	1040	1649[2]	495[2]
018A	1570	1308[2]	366[2]	**007G**	647	1649[2]	495[2]
019A	2810	1308	366	**015G**	1080	1649	495
022A	1300	1308	366	**016G**	871	1649	495
023A	971	1308	366	**021G**	706	1308[2]	366[2]
032A	644	1308	366	**022G**	1160	1649	495
033A	1050	1308	366	**023G**	4990	1649	495
034A	765	1308	366	**024G**	1640	1649	495
040A	2590	1308	366	**027G**	717	1649[2]	495[2]
049A	4280	1308	366	**028G**	332	1649[2]	495[2]
060A	1640	1649	495	**031G**	1470	1649[2]	495[2]
040G	1910	1308	366	**033G**	1020	1649	495
043G	4390	1308	366	**036G**	866	1649[2]	495[2]
079H	2150	*1308*	*366*	**037G**	2160	1649	495
080H	1970	1308	366	**038G**	828	1649	495
014A	850	1308	366	**039G**	1430	1649	495
001G	665	1649[2]	495[2]	**042G**	1380	1649	495

[1]Fe, TR (µg/L), starting Jan. 1, 2017.

[2] No compliance schedule; effective immediately upon permit issuance.

Italicized indicates that this information was added by the Division and not included in the original version of the comments.

Outfalls 001G, 006G, 007G, 016G, 018A, 021G, 022G, 027G, 028G, 036G

Previous monitoring indicate that the renewal permit WQBEL and ADBAC can be met. Therefore, since the facility can meet the limitations in the draft permit, the demonstration

has not been made that (new) degradation is necessary. Thus, because this threshold has not been met, the proposed ADBELs for these outfalls are not further considered.

Outfalls 001A, 014A, 004G, 015G, 022A, 023A, 024G, 032A, 033A, 034A, 031G, 038G, 039G, 042G , 002G, 004G, 016A, 017A, 019A, 023G, 033G, 037G, 040A, 040G, 043G, 049A, 079H, 080H

The 2 year rolling average maximum effluent concentrations for these outfalls is less than the WQBEL. Therefore, the WQBEL will not be protective of the necessary level of degradation and the ADBELs will be revised from 495 ug/l or 366 ug/l to the highest effluent value as follows;

Permit No. CO-0048062								
Outfall	**XTO Proposed Fe_{TR} Limits (µg/L)**	**WQCD Draft 30-day Avg. Fe_{TR} Limits (µg/L)**	**WQCD Draft 2-year Avg. Fe_{TR} Limits (µg/L)**	**Outfall**	**XTO Proposed Fe_{TR} Limits (µg/L)**	**WQCD Draft 30-day Avg. Fe_{TR} Limits (µg/L)**	**WQCD Draft 2-year Avg. Fe_{TR} Limits (µg/L)**	**ADOPTED ADBEL**
001A	2800	1308	366	**002G**	2520	1649	495	**001A- 738 002G- 839**
016A	1640	1308[2]	366[2]	**004G**	1820	1649	495	**016A-569 004G- 942**
017A	1380	1308[2]	366[2]	**015G**	1080	1649	495	**017A-775 015G- 647**
019A	2810	1308	366	**023G**	4990	1649	495	**019A-742 023G- 721**
022A	1300	1308	366	**014A**	850	1308	366	**022A- 553 014A- 759**
023A	971	1308	366	**024G**	1640	1649	495	**023A- 767 024G- 965**
032A	644	1308	366	**031G**	1470	1649[2]	495[2]	**032A- 445 031G- 521**
033A	1050	1308	366	**033G**	1020	1649	495	**033A- 740 033G- 612**
034A	765	1308	366	**037G**	2160	1649	495	**034A- 527 037G- 891**
040A	2590	1308	366	**038G**	828	1649	495	**040A- 946 038G- 511**
049A	4280	1308	366	**039G**	1430	1649	495	**049A- 791 039G- 658**
060A	1640	1649	495	**042G**	1380	1649	495	**060A- 923 042G- 787**
079H	2150	*1308*	*366*	**040G**	1910	1308	366	**079H- 826 040G- 718**
080H	1970	1308	366	**043G**	4390	1308	366	**080H- 756 043G- 691**

XTO Lorencito CO0048054

The Table below is from the Alternatives Analysis for total recoverable iron. Note that the Division assumes the "XTO Proposed" limits are the proposed ADBELs).

Permit No. CO-0048054			
Outfall	**XTO Proposed FeTR Limits (µg/L)**	**WQCD Draft 30-day Avg. FeTR Limits (µg/L)1**	**WQCD Draft 2-year Avg. FeTR Limits (µg/L)1**
010A	1350	1000	495
012A	2080	1000	495
016A	1770	1000	495
018A	2630	1000	495
019A	871	1000	495
021A	857	1000	495
025A	779	1000	495
027A	2120	1000	495
028A	928	1000	495
031A	1470	1000	495
032A	2770	1000	495
034A	1890	1000	495
035A	1850	1000	495
036A	3580		
037A	1476	1000	495
039A	699	10002	4952
040A	3030	1000	495
042A	2860	1000	495
045A	830	1000	495
047A	3370	1000	495
049A	1480	1000	495
050A	1580	1000	495
051A	1070	1000	495
057A	3370	1000	495
066A	4230	1000	495
067A	3010	1000	495
068A	2960	1000	495
069A	3770	1000	495
070A	6110	1000	495
072A	2380	1000	495
073A	2210	1000	495
074A	4570	1000	495
078A	2640	1000	495
082A	2650		
083A	1680	1000	495
084A	2260	1000	495
088A	1460	1000	495
091A	4850		
093A	4230	1000	495

1Fe, TR (µg/L), starting Jan. 1, 2017.

2 No compliance schedule; effective immediately upon permit issuance.

No 2 year average reporting was required for the previous permit until the conclusion of the compliance schedule in the previous permit, which is July 1, 2015. However, based on the DMR data, the Division has calculated the two year rolling average. The following table compiles the estimated maximum average two year rolling average for each outfall, as detailed in the fact sheet:

The following table compiles the estimated maximum average two year rolling average for each outfall:

Outfall	Maximum Average 2 Year Rolling Average (µg/L)
010-A	*1136*
012-A	*1211*
016-A	*819*
018-A	*1770*
019-A	*871*
021-A	*683*
025-A	*779*
027-A	*818*
028-A	*819*
031-A	*1024*
032-A	*1115*
034-A	*1279*
035-A	*1608*
036-A	*742*
037-A	*927*
039-A	*398*
040-A	*1128*
042-A	*2082.5*
045-A	*633*
047-A	*1389*
049-A	*1208.5*
050-A	*1188*
051-A	*735*
057-A	*3159*
066-A	*2168*
067-A	*944*
068-A	*2282*
069-A	*1672*
070-A	*1785*
072-A	*1645*
073-A	*778*
074-A	*1331.6*
078-A	*758*
082-A	*996*
083-A	*826*

084-A	*725*
088-A	*567*
091-A	*2483.6*
093-A	*1117*

Outfall 039A

Previous monitoring indicate that the renewal WQBEL and ADBAC can be met. Therefore, since the facility can meet the limitations in the draft permit, the demonstration has not been made that (new) degradation is necessary. Thus, because this threshold has not been met, the proposed ADBEL for this outfall is not further considered.

Outfalls 016A, 019A, 021A, 025A, 027A, 028A, 036A, 037A, 045A, 051A, 067A, 073A, 078A, 082A, 083A, 084A, 088A

The 2 year rolling average maximum effluent concentrations for these outfalls is less than the WQBEL. Therefore, the WQBEL will not be protective of the necessary level of degradation and the ADBELs will be revised from 495 ug/l to the highest effluent value as follows;

Permit No. CO-0048054				
Outfall	**XTO Proposed FeTR Limits (µg/L)**	**WQCD Draft 30-day Avg. FeTR Limits (µg/L)1**	**WQCD Draft 2-year Avg. FeTR Limits (µg/L)1**	**ADOPTED ADBEL**
016A	1770	1000	495	**819**
019A	871	1000	495	**871**
021A	857	1000	495	**683**
025A	779	1000	495	**779**
027A	2120	1000	495	**818**
028A	928	1000	495	**819**
036A	3580			**742**
037A	1476	1000	495	**947**
045A	830	1000	495	**643**
051A	1070	1000	495	**735**
067A	3010	1000	495	**944**
073A	2210	1000	495	**778**
078A	2640	1000	495	**758**
082A	2650			**996**
083A	1680	1000	495	**826**
084A	2260	1000	495	**725**
088A	1460	1000	495	**567**

Outfalls 010A, 012A, 018A, 031A, 032A, 034A, 035A, 040A, 042A, 047A, 049A, 050A, 057A, 066A, 068A, 069A, 070A, 072A, 074A, 091A, 093A

For all of these outfalls, the 2 year rolling averages are above the WQBEL. Thus, the WQBEL would therefore be protective of the ADBEL as the maximum 2 year effluent has exceeded that value. For these outfalls, the 2 year rolling average for total recoverable iron

has been removed from the permit. The 30 day average iron limitation of 1,000 ug/l is the sole iron limitation.

Comment 17: It continues to be technically and economically infeasible to treat produced water to attain the iron limits.
Despite the Division's assumptions to the contrary, it continues to be technically and economically infeasible to treat produced water to reduce iron concentrations. Based on Tetra Tech's evaluation of the produced water chemistry and required finished water quality, a reduction in iron concentrations to the 2-year average concentration as low as 363 µg/l would require a robust treatment process that includes microfiltration ("MF") and pipe network to collect and convey produced water to nine separate treatment facilities to consistently meet the target iron concentration needed to comply with the lower 2-year average limitations. The capital costs of MF treatment and backwash disposal of the waste stream for both Pioneer and XTO is estimated at $83.3M – $91.9M, or alternatively, disposing produced water via injection ($93M – $184.8M) is not economically viable. Moreover, once the produced water is injected, no produced water will be available for other uses in the Purgatoire watershed including agricultural, wildlife, recreation, and tourism purposes.

The Companies have set forth the economic realities of treating produced water to reduce these concentrations in the alternatives analysis included hereto as Attachment B.

Furthermore, the Division is already in possession of a significant body of data—collected at the Companies' expense—that shows that the new limitations cannot be met and why they cannot be met. *See* Pioneer Iron Compliance Reports; Pioneer DMRs from 2011-present (previously submitted to Division). However, in four years, the Division did not provide any feedback on annual compliance reports. The Division has chosen to implement requirements that can only be met at the end of the pipe with the installation of at least 50 water treatment facilities – one for each outfall where iron cannot be achieved or alternatively, sewer infrastructure from each tributary canyon to nine satellite MF treatment facilities located at the bottom of each tributary canyon produced water is discharged into. The Division is already aware of the infeasibility of treating water at different locations in the field, as this was addressed in the alternatives analysis previously submitted to the Division for chloride and Commission hearings. Letter from R. Sandquist to A. Neuhart re: Alternatives Analysis for Chloride (Nov. 28, 2012), and Pioneer submissions for the June 2013 Hearings on Arkansas River certifications

The Division is already aware of the infeasibility of treating water at different locations in the field, as this was addressed in the alternatives analysis previously submitted to the Division for chloride and Commission hearings. Letter from R. Sandquist to A. Neuhart re: Alternatives Analysis for Chloride (Nov. 28, 2012), and Pioneer submissions for the June 2013 Hearings on Arkansas River certifications and standards.

Response 17: The Division does not agree with the extent of treatment needed based on Tetra Tech's analysis. Based on the implementation of the antidegradation alternatives analysis and review of DMR data the Division's conclusion is that the majority of the outfalls that can comply with WET requirements can also comply with iron. However the permittee has indicated for many years and indicated in their comments on the permit renewal that became effective in

February 2010 that their selected option to manage their pollution would be underground injection over treatment. The permittee has the option of implementing their selected measure of control to comply with effluent limits.

Comment 18: In four years, the Division did not provide any feedback on annual compliance reports. The Division has chosen to implement requirements that can only be met at the end of the pipe with the installation of at least 34 water treatment facilities – one for each outfall where iron cannot be achieved or alternatively, sewer infrastructure from each tributary canyon to nine satellite MF treatment facilities located at the bottom of each tributary canyon produced water is discharged into. The Division is already aware of the infeasibility of treating water at different locations in the field, as this was addressed in the alternatives analysis previously submitted to the Division for chloride and Commission hearings. Letter from R. Sandquist to A. Neuhart re: Alternatives Analysis for Chloride (Nov. 28, 2012), and XTO submissions for the June 2013 Hearings on Arkansas River certifications and standards.

To the extent the Draft Permits impose new, significantly more stringent iron limits, an appropriate compliance schedule (i.e., a minimum of five (5) years) is required. 5 C.C.R. § 1002-31.14(4) and 1002-61.8; *see also* WQCD, Permit Compliance Schedules, Clean Water Policy No. 3 (March 4, 2014).

Response 18: See response to comment 5 regarding compliance schedule durations.
The Division responded in writing to the review of the documents as a part of the permit renewal process. The following summary was included in the fact sheet for the draft permit and is maintained in the final version:

> With the 2011 submittal, the iron trading proposal was researched, along with the options presented in the first report. The facility found that settling and filtration testing did not result in a large enough reduction in iron. Settling the discharge alone did not appear to have any significant effect on the levels of total recoverable iron in the discharge either*; however the addition of chemical flocculants were not explored in this compliance schedule.* The facility indicated that oxidation occurs naturally when the CBM water is brought to the surface. The permittee decided to pursue the iron trading option further.
>
> The 2012 compliance schedule submittal removed the settling and filtration option. The oxidation option, while occurring naturally, would not provide enough reduction in order for the discharges to comply with future limitations. *The ponds, settling, and flocculation was addressed, but without testing any flocculants, and was dismissed as not being effective enough to comply with final permit limitations for iron*. The 2012 compliance schedule selected the iron trading option (emphasis added)

XTO and Pioneer: Comments on SAR and EC

Comment 19: "Current Conditions" Should Reflect Status Quo, Not More Restrictive Water Quality Limits

The produced water benefits many sectors of the local economy and also fish, wildlife, and aquatic communities. In preparing the Draft Permits, the Division frequently references the "current condition." Presumably, that would be the status quo, but as applied in the Draft Permits, the current condition would require the Companies to implement additional pollutant reduction measures, water flow restrictions and significant and expensive monitoring. This is not status quo. These proposed requirements would alter the "current condition" as that term has been defined and applied by the Division. The Division's very description of "current condition" in the regulations typically describes a process by which:

> [T]he Division will assess the current effluent quality, recognizing that it changes over time due to variability in treatment plant removal efficiency and influent loading from industrial, commercial, and residential sources. One necessary element of an approach to maintain the current condition would be a requirement that the total loading from commercial and industrial contributors be maintained at that level as of the date of adoption of the temporary modification and that neither the concentration nor the frequency of high concentration shall increase over historic levels and frequency.

See 5 C.C.R. § 1002-38.66 (emphasis added).

Although "current condition" is most frequently used for temporary modifications, it is not unreasonable to expect that when the same agency uses the same term in another context, the same definition and parameters are intended to apply. One example states: "The Commission's intent of using this notation is to preserve the status quo during the term of the temporary modification. Discharges to those segments shall continue to be authorized to discharge the subject pollutant at their current permitted concentration and flow levels." *Id*. § 1002-38.74(M). Similarly:

> Where the Commission has adopted a narrative temporary modification of "current condition", the Commission intends that, when implementing the temporary modification in a CDPS permit, the permit conditions will reflect the current effluent quality, recognizing that it changes over time due to seasonal variability, change in the effluent flow and the concentration over time. *Id*. § 1002-33.52(J).

In implementing more stringent EC/SAR limits, the Division repeatedly stated that it established these limitations based on an effort to maintain the "current conditions" within the watershed. The Division explained:

> The current condition approach used for both the 2014 modification and for this renewal permit is to establish effluent limits that characterize the water quality of the discharge for the period of record January 1, 2010 through September 30, 2012. Effluent limits are intended to hold the current condition in place from a water quality standpoint, which allow the permittee operational flexibility to change the quantity and quality of water from each outfall, to the extent that these changes do not result in a significant departure from the characterized condition. The Division agrees that these changes in quality can be attributed to a number of operational factors, including reductions and increases in flow

> from existing sources within the piping network to each outfall, changes in chemistry in groundwater formations from which produced water is currently withdrawn, changes in formations from which groundwater is withdrawn within existing wells, and changes in sources (wells) to the outfall piping network.

Allowing for operational and discharge changes that do not result in a decrease in water quality is consistent with the Division's past practices in developing limitations to maintain "current conditions." As noted above, "current condition" is typically used in the context of temporary modifications. *See, e.g.*, 5 C.C.R. § 1002-38.82 ("the Division will assess the current effluent quality, recognizing that it changes over time due to variability in treatment plant removal efficiency and influent loading from industrial, commercial, and residential sources. One necessary element of an approach to maintain the current condition would be a requirement that the total loading from commercial and industrial contributors be maintained at that level as of the date of adoption of the temporary modification and that neither the concentration nor the frequency of high concentration shall increase over historic levels and frequency.").

However, the Division erred by defining the period for "current condition" as January 2010 through September 30, 2012, because the period of CBM operations is significantly longer and considering data before 2010 and after 2012 will more accurately reflect the variability in conditions that are truly the "current condition." The data record and the historic uses of produced water support that the "current condition" for at least 15 years has been relatively consistent.

Despite espousing that the new limits would allow the Companies' operational flexibility, the Draft Permits imposed flow limits to specific outfalls that restrict the location and combination of outfalls, which negates the flexibility the Division highlighted in imposing new limits based on "current conditions." The Division's explanation for imposing new, more stringent limits while also imposing flow limits flies in the face of the Division's past practice in applying limits that maintain "current conditions."

The purpose of the "current condition" approach is to maintain current environmental standards in the receiving body, allowing the permittee some flexibility in the details of its operations so long as the ultimate outcome is satisfactory. Imposing per-outfall limits, however, with no regard for the actual condition of the receiving body or operational realities, contradicts the very purpose of the "current condition" approach. Years of real-life experience with the Companies' operations in the Raton Basin show that the current condition of the Purgatoire River is clean and healthy and that the Companies' continued CBM operations will not adversely impact the River. Such a backward application of the Division's stated methodology is arbitrary and capricious.

Current condition is equivalent to status quo—i.e., no major changes—it recognizes the variability in flows, effluent concentrations that have been historically evidenced in the natural system. The Division must implement "current conditions" in these permits as it is defined; which will result in the status quo for discharges under these permits.

Response 19: The permitting approach is distinct from the "current condition" approach adopted in the referenced temporary modifications. The Division has enhanced the fact sheet language

to provide further clarity regarding the approach used to establish effluent limits for EC and SAR. The Division has also removed the term "current condition" to minimize confusion.

Comment 20: More Restrictive EC/SAR Limits Are Unnecessary
Throughout the history of CBM operations in the Purgatoire basin, levels of EC and SAR in the Purgatoire River have satisfied agricultural (irrigation) use requirements at their points of use. This is evidence that historic CBM water management practices have been protective of the water quality for agricultural uses. These findings are based upon extensive water quality monitoring in the Purgatoire River from April 2010 through the present, supported by XTO. Such monitoring included continuous sampling for many parameters and monthly sampling for others. EC and SAR were sampled continuously at nine locations and monthly at 27 locations in the Purgatoire River, upstream and downstream of CBM discharges. As shown in Figure XII-1, XTO's discharge outfalls are located in tributary canyons and agricultural irrigation uses only occur through active water diversions from the Purgatoire mainstem (Segment COARLA05b), located many miles downstream of XTO's discharges.

Irrigated agriculture is protected at the River and diversions for irrigated crops. EC and SAR data have consistently been less than threshold levels protective of agriculture in the Purgatoire Valley, 1.3 dS/m EC and 6.8 SAR.

Recently, Pioneer and XTO conducted soil analyses in irrigated fields. Those lands have been irrigated with Purgatoire River water, which includes CBM-produced water, for more than 20 years. Because of their senior water rights, irrigation of these fields continued during times of extreme low flow (e.g,, 2002, 2011, 2012) due to drought. See Testimony of J. Vigil, Arkansas River Classifications and Standard Proceedings (June 2013). Even during times of extreme low flow due to drought, some irrigation of these fields has occurred. Soil samples obtained on October 7, 2014 indicate that the soils within the irrigated fields have pH, EC and SAR levels that will not impair crop growth and development of soil structure. Soil EC was less than 1.0 dS/m at all depths in both fields with an average root zone salinity of 0.3 dS/m, a level that is protective of the most EC sensitive crop (alfalfa) grown in the Purgatoire watershed upstream of Trinidad Lake. WQCD "Appendix A – Water Quality Assessment, Purgatoire River Canyon above Trinidad Reservoir" (rev. Dec. 7, 2009). The soil SAR ranges from 1.2 to 1.5 and 0.9 to 1.3 in the two fields sampled and the pH ranges from 7.6 to 8.0 and 7.2 to 7.7 in the fields. The soil pH, EC and SAR are all within acceptable ranges for soils within this region and are consistent with the values for Mauricanyon soils published by the U.S. Department of Agriculture, Natural Resources Conservation Service. "Soil Survey of Las Animas County Area, Colorado, parts of Huerfano and Las Animas Counties" (2009). Moreover, in accordance with permit terms, Tetra Tech conducted soil sampling in fields irrigated for many years with waters containing CBM-produced water. Tetra Tech, "Fall 2014 Soil Sampling Results for Irrigated Soils Along the Purgatoire River Upstream From Trinidad Reservoir" (Dec. 2014). Nothing in the October 2014 soil data suggests that irrigation of these fields with a mixture of Purgatoire River water and CBM produced water discharged for almost 20 years has impacted the soil chemistry. *Id*.

To provide some historical background on the EC and SAR permitting issues, in its October 2013 permit modification request, XTO sought to limit EC and SAR to the 85th percentile of existing levels in the Purgatoire River upstream of Trinidad Reservoir with

historical data collected by the company, with a 20% allowance for variation as accepted in laboratory duplicate analyses. The Division responded to this request by setting permit limits for flows and EC/SAR at each of XTO's outfalls in the permit modifications dated April 1, 2014 based upon "maximum levels" (after eliminating what the Division perceived to be "outlier" SAR values). However, there is significant variability in flows and laboratory analysis of EC/SAR that needs to be addressed in the permit limits. Upon reviewing updated data and the Draft Permit, XTO realized that the Division's proposed approach was infeasible. XTO recognized the need for caps on flow and EC/SAR, yet under the Division's modifications, some outfalls would immediately exceed flow and SAR limits.

XTO's discharges, as demonstrated by water quality and soils salinity investigations conducted by Tetra Tech, are protective of the agricultural uses. Moreover, what is truly important are the cumulative amounts and concentrations of water (i.e., EC and SAR loads) delivered to the Purgatoire River where the irrigation use occurs. In order to address these concerns, XTO urged the Division to incorporate a tributary-based approach for flow, EC and SAR that would maintain "current conditions" and assure protection of these values in the Purgatoire River.

A tributary-based approach is supported by the Division's statutory and regulatory authority. A primary purpose of the Water Quality Control Act's discharge permitting process is to prevent "a discharge that by itself or in combination with other pollution will result in pollution of the receiving waters in excess of the pollution permitted by an applicable water quality standard, unless the permit contains effluent limitations and a schedule of compliance specifying treatment requirements." C.R.S. § 25-8-503(4); *see also* 5 C.C.R. § 1002-61.8(1)(e) (regulatory language mirroring the statute). Effluent limitations must be based on "application of appropriate physical, chemical, and biological factors reasonably necessary to achieve the levels of protection required by the standards." *Id*.; *see also* 5 C.C.R. § 1002-61.8(2)(b) (noting that such a determination should be made on a case-by-case basis). Caps on flow and EC/SAR for each tributary, based on historic flows and loads, would maintain historic levels of compliance while allowing for some variability (natural and operational) within and among the outfalls within each tributary.

In response to the approach XTO presented in October 2013, the Division issued permit modifications on February 28, 2014 (to become effective April 1, 2014). *See* 48054 Fact Sheet to Modification 4 (Feb. 28, 2014); 48062 Fact Sheet to Modification No. 5 (Feb. 28, 2014). The February 28, 2014 modification "set the maximum recorded SAR value for each outfall removing outliers) as the effluent limit to maintain the 'current condition' of the Purgatoire River." 48054 Fact Sheet at 14-15 (Feb. 28, 2014); 48062 Fact Sheet at 13-14 (Feb. 28, 2014). For EC, the February 28, 2014 modification set the EC limitation at the maximum recorded value. 48054 Fact Sheet at 15 (Feb. 28, 2014); 48062 Fact Sheet at 14 (Feb. 28, 2014). Additionally, the modification established flow limits for each outfall, and increased the frequency of required EC/SAR sampling from quarterly to monthly. 48054 Fact Sheet at 15-17 (Feb. 28, 2014); 48062 Fact Sheet at 14-16 (Feb. 28, 2014).

Upon implementation, however, problems with the SAR approach adopted in the permit modifications were readily apparent. Although first quarter reports on SAR compliance were not due until July 2014, XTO contacted the Division in June 2014 regarding compliance issues. *See* email from K. Morgan, WQCD, to XTO re: WQCD-XTO 6/25/14 meeting follow-up (June 26,

2014) (acknowledging meeting on June 25, 2014 and outlining investigation and studies to be undertaken by XTO to identify sources and reasons for EC/SAR non-compliance and testing of water treatment options).

Later, XTO requested a compliance schedule. *See* 48054 EC/SAR Permit Modification Form (Aug. 6, 2014); 48062 EC/SAR Permit Modification Form (Aug. 6, 2014). In the requests, XTO noted that, since new EC/SAR limitations became effective in April 2014, XTO had "experienced compliance issues meeting the EC/SAR values contained in the Permits." *See* Sandquist Letter at 1 (Aug. 6, 2014). XTO accordingly sought "to modify the Permits to include a compliance schedule for EC/SAR with 'report only' requirements that will provide XTO with adequate time to assess how to comply with EC/SAR limits and to gather additional data to support revised EC/SAR limits." *Id.* XTO's primary rationale for requesting a compliance schedule was that the new EC/SAR protocol required monthly sampling, yet the limits were derived from quarterly data. *Id*. at 2. XTO and its consultants suggested that the variability of the underlying data set explained why certain outfalls reported minute exceedances under the new "current condition" limits even though there were no significant changes in field operations. *Id*.

This variability was identified not only in the field, but also under laboratory conditions where duplicate analyses produced different results in terms of compliance or noncompliance with SAR limits. *Id*. Compounding the need for additional data, XTO noted, was the documented fact that naturally existing geological differences in coal formations create considerable variability in the major ion compositions of groundwater. *See id*. (citing USGS, Geldon and Abbott, 1984).

The revised EC/SAR limits resulted in unpredictable, minor exceedances within outfalls. *See* Sandquist Letter at 2 (Aug. 6, 2014). However, the exceedances are classified as minor because the numeric values were within the laboratory variability for SAR testing conducted using EPA-approved analytical methods and EPA quality control guidance. In other words, as demonstrated by laboratory analyses and retesting, outfalls that met the limits one day would not on another. Accordingly, XTO asked for additional time to gather data to support statistically valid, revised limits, and to assess how to comply with those limits. *See id*. at 2-3.

XTO proposed a compliance schedule wherein XTO would test EC/SAR for a 24-month period and report the monthly average as "report only." *Id*. at 3. After 12 months, XTO would submit its sampling and testing results to the Division. *Id*. At the end of the 24-month period, XTO would report its EC/SAR results to the Division and provide recommended steps for EC/SAR compliance, and a schedule for compliance. *Id*. XTO cited 5 C.C.R. §§ 1002-61.8(3)(b) and 1002-61.8(8)(a)(i) as the regulatory basis for the imposition of a compliance schedule. *Id*. At 1-2. XTO sought a 24-month report-only compliance period; it did not suggest that the existing EC/SAR levels should be discarded. Importantly, during this time the Level 1 (soil salinity) and Level 2 (Purgatoire River water quality) monitoring programs in the permits would remain in effect, documenting that current conditions were maintained and agricultural uses were protected in the downstream Purgatoire (segment COARLA05b).

After reporting the SAR non-compliance, XTO undertook vigorous testing and re-testing to determine sources/reasons for levels above permit limits. XTO completed its Interim Report and submitted it to the Division on October 30, 2014. *See* email from R. Sandquist to K. Morgan,

WQCD, re: XTO Bench Scale Progress Report (Oct. 30, 2014). XTO also completed its analysis of SAR, bench scale testing protocols, evaluation of potential chemical additives to reduce the SAR in produced water, treatment analyses and summaries. A final report was submitted detailing the field data, data vulnerability and discrepancies, information on the extent of chemical addition methods to reduce the SAR, as well as the associated response from inter-related water quality measurements of EC, pH, and WET. *See* Letter from R. Sandquist to K. Morgan, WQCD, re: SAR Data and Monitoring Reports, Potential SAR Exceedances Reported June 2014 (Dec. 31, 2014).

XTO met with the Division on multiple occasions to discuss EC/SAR permitting approaches from December 2013 until the Draft Permits were issued on February 6, 2015. *See* email from R. Sandquist to P. Pfaltzgraff, WQCD, re: RE: XTO Energy & Pioneer Natural Resources Meeting with WQCD Permits Section (Feb. 11, 2014).12 The history of the Division's approach to addressing this issue demonstrates the arbitrary and haphazard way in which the Division has rejected XTO's proposals.

Response 20: The effluent limits for EC and SAR in this renewal permit are not more restrictive than the corresponding limits in the current permit. The effluent limits for EC in this renewal permit are the same as the limits in the current permit. The effluent limits for SAR in this renewal permit and the method to determine compliance with the SAR effluent limit is less stringent than in the current permit. The division has enhanced the discussion in the fact sheet regarding the LCL method to provide further explanation and clarity.

Based on the comment the Division also evaluated the use of a higher statistical criterion as the level of confidence for determining compliance with the effluent limit, 99%, versus a 95% that was used in the draft permit. Increasing the level of confidence to 99% provides an even greater level of confidence that a result that exceeds the effluent limit represents a concentration of the new data that is significantly greater than the concentration that represents the initial effluent discharge concentration. In other words, the water quality has significantly worsened. This revision to 99% resulted in a less stringent approach for the final permit, in comparison to the draft permit, again both of which are less stringent than the approach for SAR in the current permit.

The permittee states that they "recognize the need for caps on flow and EC/SAR." The division agrees that reasonable potential exists and effluent limits must be established for flow, EC, and SAR. The fact sheet explains this determination, and how the division must establish effluent limits in a manner consistent with the Commissions methodology for establishing numeric water quality standards.

As an additional regulatory tool, the permittee may choose to request that a numeric site-specific water quality standard from the Water Quality Control Commission, which would be binding in the permitting process.

The permittee suggests a "tributary based approach" with "caps on flow and EC/SAR for each tributary". To the extent this statement is a request for the establishment of in-stream

compliance points, the Division reiterates its previous response to this comment: (see permit fact sheet for permit modification issued February 28, 2014 effective April 1, 2014).

> This is in accordance with the Water Quality Control Act 25-8-501 which requires a permit for the discharge of pollutants to state waters from a point source (and the tributaries upstream of the Purgatoire River are state water), and Regulation 61.8(2)(e) which requires that, "All permit effluent limitations, standards and prohibitions shall be established for each outfall or discharge point of the permitted facility…." Therefore, the limitations have been incorporated as discussed above at the individual outfall locations. Regulation 61.8(3)(r) states, "The permit shall include best management practices to control or abate the discharge of pollutants when numeric effluent limitations are infeasible, when the practices are reasonably necessary to achieve effluent limitations and standards, or when authorized under 304(e) of the federal act for control of toxic pollutants and hazardous substances." The Division has determined in this case that numeric effluent limits are feasible.

Effluent limits must be establish to define the level of pollutant control necessary for a discharge to state waters. The effluent limits must also be established at the permitted facility, where the permittee has operational control to provide treatment or other operational controls needed to comply with the effluent limitations, such as in this case blending sources of water with differing water quality to the point of discharge.

Comment 21: A. EC/SAR limitations should not apply to outfalls in Segment 6a, as there are no active diversions present and no agricultural irrigation use connections.

EC/SAR limitations should not apply to outfalls that discharge to drainages where no irrigation diversions are present. This situation exists for most of the Companies' outfalls in Lower Arkansas River Segment COARLA06a (Segment 6a), where the actual agricultural use is limited to livestock watering. EC and SAR limits were specifically developed and implemented to protect irrigated crops, not livestock**.**

Response 21: The Division has applied EC/SAR limits to outfalls that discharge to receiving waters upstream of irrigation intakes. This includes discharges to tributaries that do not have an irrigation intake, but for which the discharge reaches a downstream water body where an irrigation intake exists.

Comment 22: B. The Division misinterpreted that XTO was requesting a removal of the new EC/SAR limitations.

The Division mischaracterized XTO's request for a period of report-only monitoring as a request to remove the new EC/SAR limitations indefinitely. *See* 48054 Fact Sheet at 6; 48062 Fact Sheet at 23. This, the Division found, did not meet the WQCA's definition of "compliance schedule," which requires "an established sequence of actions leading to compliance." 48054 Fact Sheet at 6-7; 48062 Fact Sheet at 6-7.

XTO did not request that the underlying EC/SAR limits be removed for an undetermined amount of time. Instead, XTO asked for a 24-month period of "report only" monitoring that would allow for additional data gathering in order to determine whether the EC/SAR limits should be modified or compliance with those limits determined in another manner. *See* Sandquist Letter at 3 (Aug. 6, 2014). The modification request set forth a proposed compliance schedule, specifically outlining the sequence of actions XTO would take to come into compliance (Table XII-1). "SAR/EC Compliance Schedule," Sandquist Letter at Exhibit A (Aug. 6, 2014).

It has been standard procedure by the Division to retain numeric discharge limits in permits subject to compliance schedules, but those limits do not take effect until the compliance schedule expires. As noted in the modification request, the outfalls exhibit considerable unpredictability under the new limits and new monthly reporting requirements. *See id*. at 2. Many outfalls would randomly demonstrate minor exceedances from test to test. This was the case for both EC and SAR. Permit-wide compliance schedules for both SAR and EC are appropriate and would address this unpredictability, not merely to bring a handful of outfalls into compliance. 5 C.C.R. § 1002-31.14(4) and 1002-61.8; *see also* WQCD, Permit Compliance Schedules, Clean Water Policy No. 3 (March 4, 2014).

Response 22: The Division appreciates the clarification. The fact sheet has been revised to restate the permittee's request and the consideration of the request has been revised accordingly.

Comment 23: C. The revised SAR approach does not account for laboratory precision. The revised SAR approach is also inappropriate due to unavoidable variability in laboratory test results. XTO originally proposed an 85th percentile approach incorporating a 20 percent margin of error necessary to account for inherent imprecision in laboratory testing for SAR. XTO did not pull this approach out of thin air, but in fact derived it from established EPA testing methodology. Such methodology accounts for the fact that, under laboratory conditions, the same sample can be analyzed and re-analyzed and the results can vary by as much as 20 percent. *See* Memorandum from K. Quast, Norwest Corp., to L. Mulsoff re: SAR effected by sodium reporting accuracy and precision (June 17, 2014). From a practical standpoint, variations within this range have had no measurable effect on downstream water used for irrigation, as monitored in the Purgatoire River. *Id*. The Division's rejection of any margin of error amounts to an unfounded presumption that laboratory data are perfectly accurate and precise. Because laboratory data demonstrate unavoidable variability, however, the Division's selection of the lower confidence limit ("LCL") approach, which does not take such variability into account, is arbitrary and capricious.

Response 23: The permittee argues that effluent limits for SAR should be adjusted to account for poor analytical precision. As the division stated in the fact sheet for the permit modification issued February 28, 2014 effective April 1, 2014, laboratory analyses can account for relative percent differences when validating data. Laboratories also have flexibility in accounting for analytical precision in how the determine a minimum level, or reporting limit, from a method detection limit (See Division Policy CW 6 "Practical Quantitation Limits" Effective February 3, 2015). If precision is as poor as the permittee suggests, it would be a strong argument for seeking ways to improve analytical precision. This might be accomplished by finding a more

precise test method or by increasing sample size. In any case, poor analytical precision is not an argument for relaxing an effluent limit.

Comment 24: D. The draft permits create a disincentive to retest for SAR.
Unlike the existing permits, the Draft Permits have a disincentive for retesting EC and SAR. Assuming that one sample per month ($n = 6$) were collected, then the semiannual compliance reporting would use a LCL value of 0.417 at $\hat{p} = 0.85$. This means that the 41.7^{th} percentile SAR value of the six samples would be tested against the effluent limit. However, if an additional sample were collected ($n = 7$), then the semiannual test uses a higher LCL value of 0.464 (i.e., the 46.4th percentile SAR value of the seven samples would be tested against the effluent limit). If two retests were performed during the six month period ($n = 8$), then the LCL value of 0.499 essentially tests the median of the 8 samples against the effluent limit. In other words, the more samples Pioneer collects, the smaller their compliance "window" becomes.

Response 24: The permittee argues incorrectly that increasing the sample size narrows the "compliance window". While it is true that the threshold percentile increases with sample size, the confidence level has not changed. The confidence level for the test is 99%, and it is the same for any sample size. It is to be expected that the confidence interval will become narrower as sample size increases. Consequently, although the threshold percentile increases with sample size as noted in the comment, it has no effect on the likelihood of exceedance. There is no penalty for increasing sample size, and the additional precision (see comment above) may provide a more reliable result.

Comment 25: E. It is illegal to have permit limits where compliance cannot be predicted because XTO cannot determine necessary controls to attain proposed limits.
The Division's own analysis demonstrates that XTO will have difficulty consistently meeting the SAR limits. In the Fact Sheets, the Division provides the results of its analysis and states that "discharge data from January 1, 2014 through September 20, 2014 would exhibit exceedances of the revised effluent limits, using the LCL concentration method,,, " 48054 Fact Sheet at 10-11; 48062 Fact Sheet at 10-11. Specifically, the Division's analysis indicates that 7 of 37 (19%) active XTO outfalls with SAR limits in Draft Permit No. CO-0048054 (Lorencito) and 5 of 38 (13 %) active XTO outfalls with SAR limits in Draft Permit No. CO-0048062 (Alamocito) would have exceeded the proposed SAR limits during this period. Draft 48054 Permit at 39; Draft 48062 Permit at 49.

The performance of the Division's proposed SAR approach to setting limits was evaluated using existing data and by generating random data within the range of observed values for all data and for the "current condition" (from 2010 to 3rd quarter 2013). Potential exceedances using the Division's proposed SAR approach were evaluated by generating two random, but very probable, semi-annual datasets with the RANDBETWEEN Excel function using the minimum and maximum values from the "current condition" dataset at each site. The results of this analysis confirm the Division's own acknowledgment in the Fact Sheets that exceedances of SAR limits using the LCL concentration are likely. In addition, the analysis indicated that compliance with the SAR limits will be unpredictable. Specifically, from one semi-annual period to the next, those outfalls exceeding their limits could change. Consequently, it will be difficult to identify which outfall needs to be mitigated. This demonstrates that the Division's proposed

SAR approach is flawed, due to Type 1 error, in that the "current condition" data itself can easily generate outfall specific exceedances that vary statistically from one semi-annual reporting period to the next and for sites that, to date, have not shown an exceedance.

In summary, the Division's proposed statistical approach will result in a high probability of exceeding an effluent limit that will vary from site to site for each semi-annual reporting period.

Response 25: The permittee does not cite or explain the basis for its assertion that it is "illegal" to have permit limits where compliance cannot be predicted. The permittee only explains that compliance with the draft permit limits for SAR may not be achieved for some outfalls. The Division knows of no such provision in the Water Quality Control Act or Water Quality Control Commission regulations and therefore cannot respond to this comment.

The Division disagrees that there is a high likelihood of a Type I error using the LCL method. To the contrary, under the LCL approach, the discharge concentration that is set as the effluent limit can be exceeded, up to a point, without triggering an effluent limit exceedance. When a effluent limit exceedance is triggered, there is a high level of confidence that the result that exceeds the effluent limit represents a concentration of the new data that is significantly greater than the concentration that represents the initial effluent discharge concentration. With the 99% confidence there is a very high level of confidence that the worsening of water quality is significant, there is only a 1 % chance for mistakenly concluding that the reported value differs from the initial effluent discharge concentration, a Type I error.

Comment 26: F. SAR limits should be set at the maximum historic values, which have proven protective.

Although XTO did not request it, the Division developed a revised SAR approach based on the LCL method developed for the 2016 Listing Methodology, in which the LCL concentration of the reported value would be compared to the effluent limitations (which are based on the 85th percentile of the "current condition" data) on a semi-annual basis. 48054 Fact Sheet at 8-10; 48062 Fact Sheet at 8-10; *see also* Draft Permits, Appendix B – Statistical Method Used for Compliance Determinations for SAR (Jan. 8, 2015) ("Appendix B"). By contrast, the limits in the February 28, 2014 modification were based on the maximum value observed in the "current condition" dataset. 48054 Permit at 5-6; 48062 Permit at 6-7.

The 85th percentile and the 95% LCL of the 85th percentile approach is based on a policy for determining water quality impairment under 303(d). *See generally* Appendix B. These statistical protocols were not established, or approved, for developing limits in discharge permits.
In the Fact Sheets, the Division attempts to explain its reasons for selecting this approach:

> The Division maintains that the data used in setting the current permit limitations for EC and SAR was based on a representative data set that was adequate for evaluating "current condition".

48054 Fact Sheet at 7; 48062 Fact Sheet at 7. However, the above statement was written with respect to the SAR limits in the existing permits, prior to the introduction of the new revised methodology using the 85th percentile. The existing SAR limits are based on the maximum of 15 quarterly SAR values from the "current condition" time frame of 2010 to 3rd quarter of 2013. The Division goes on to explain:

> Nevertheless, noting the "field variability" described above, the Division explored options for the establishment of effluent limitations and evaluation of compliance for limits for SAR which, would expressly allow for variability and for slight single value exceedances of the current permit limits to be considered compliant.

48054 Fact Sheet at 8; 48062 Fact Sheet at 8. However, the 85th percentile method selected for setting the new SAR limits does the opposite of allowing for variability by design. A percentile indicates the relative standing of a data value when the data are sorted in numerical order and the percent of data values are less than or equal to the *n*-th percentile. For example, 85% of data values are less than or equal to the 85th percentile and 15% of the data values (including the maximum) exceed the 85th percentile. Percentiles are mostly used with very large data sets because removing data values, such as the top 15% when using the 85th percentile, is not significant. However, with smaller datasets, such as here, this censorship can have significant implications. When using the 85th percentile, 15% of the highest data points are removed from the analysis. In the case of 15 data points the two highest values are removed reducing the dataset to only 13 values. Additionally, removing these two values also reduces the variability of the dataset, especially when the spread in data values is large. Thus, the use of percentiles reduces the variability in the available dataset by removing the largest numbers and restricting the remaining numbers to the lower values. This censorship achieves the opposite effect of what was sought by Division when making the revised SAR limit approach.

Response 26: The Division determined that the 85th percentile and LCL methodology were appropriate for the establishment of effluent limits for SAR. The division has enhanced the discussion in the fact sheet to provide further clarity.

The comment argues that by censoring the data set, the Division has reduced the variability in a way that adversely affects the limit was set. The comment reflects a misunderstanding regarding the method and, specifically, the reason for selecting the 85thpercentile. Moreover, the misunderstanding extends to the effect of the method on sample size (there is no effect). The division has provided some additional explanation regarding the method and the purpose for a particular percentile in the Fact Sheet to address the misunderstanding. The LCL method does not involve censorship and the method has no effect on the variability of the data set. Instead, it makes optimal use of the available data, and it applies a clear statistical approach for reaching conclusions about compliance. Outliers were not removed from the calculation of the 85th percentile. It is a distinct statistical approach from the use of a maximum.

Comment 27: G. The Division erroneously thought the data set was large, so using the 85th percentile would be inappropriate.

The Division states that the SAR "current condition" effluent limitations are based on "15 data points from each outfall from January 2010 through September 2013. This resulted in an

evaluation based on well over 500 data points for this facility." 48054 Fact Sheet at 7; 48062 Fact Sheet at 7. This is a misleading statement. The Division's dataset actually only involves 13 data points per outfall, because two values were eliminated. As such, the Division's analyses are based on 13 quarterly data points for each outfall, *not* a combined analysis of 500 data points as the Fact Sheet suggests. The potential variability between these datasets of size n=13 and n=500 are quite different. For example, Appendix B, Table 2 of the Draft Permits indicate an LCL of 0.622 ($\hat{p}$ = 0.85) for n = 15 [sic, n = 13, LCL is 0.599]. However, for n = 100 (highest value provided in Table 2) the LCL is much higher (0.780). For a sample size of n = 500, the LCL would be well above that at n = 13.

Furthermore, the Division's assessment of "current condition" is inconsistent with the Division's past practices in applying this term. The purpose of the "current condition" approach is to maintain current environmental standards in the receiving body, allowing the permittee some flexibility in the details of its operations so long as the ultimate outcome is satisfactory. Imposing per-outfall limits, however, with no regard for the actual condition of the receiving body, contradicts the very purpose of the "current condition" approach. The Division has not established that the "current condition" warrants more stringent EC/SAR limits. In fact, data from April 2010 to December 2014 indicates that EC/SAR levels in the Purgatoire River downstream of the outfalls remain protective of crops grown and irrigated in the basin. *See* Figures I-1 and XII-2 above.

Response 27: The Division has revised the discussion in the fact sheet. The Division determined that the data set was adequate for establishment of effluent limits.

Comment 28: H. The Division is not authorized to dictate the Companies' operations in order to accommodate its proposed SAR monitoring schedule.

In its discussion of SAR sample collection, the Division states that:

> [T]he permittee is encouraged to plan any decommissioning of outfalls for the end of the reporting period, or to collect additional samples in advance of any planned decommissioning to ensure that the minimum of five samples needed to report the LCL concentration will be available.

480054 Fact Sheet at 9; 48062 Fact Sheet at 9. This statement fails to acknowledge or account for unplanned shutdowns of outfalls, such as those due to prolonged cold weather, large snow/rainfall events, and wildfires or due to unscheduled operational issues such as pump failures. In suggesting that the Companies' should plan outfall operations to accommodate the Division's monitoring schedule is beyond the Division's authority and ignores operational realities. Force majeure events could cause unexpected and unplanned shutdowns of outfalls that would impact the Division's proposed monitoring schedule. To accommodate these operational realities, the monitoring schedule should be monthly and the minimum number of samples collected during that monitoring period will represent what activity actually took place at the outfall. The Companies cannot anticipate or plan for unexpected outfall shutdowns and the monitoring schedule must take this reality into account.

Response 28: The Division is not dictating the permittee's operations. The six-month reporting period is designed to allow flexibility, specifically the period is of a long enough duration that unusual events such as weather and mechanical issues could be resolved and the sampling could

be adjusted over the six-month period. The issues cited in the comment (prolonged cold weather, large snow/rainfall events, and wildfires or due to unscheduled operational issues such as pump failures) would not foreclose the permittee's ability to sample over a six-month period. However, decommissioning a well would, which is why the Division merely suggested, not mandated, that the permittee plan ahead and collect the minimum number of samples prior to decommissioning a well.

Please see response to comment 14. This describes the way in which the permitting and compliance framework addresses events where the permittee is unable to collect the required number of samples due to situations such as weather.

Comment 29: I. The Division's application of "current condition" in developing limitations in the Draft Permits is inconsistent with prior agency practice and without justification.

In implementing more stringent EC/SAR limits, the Division repeatedly stated that it established these limitations based on effort to maintain the "current conditions" within the watershed. The Division explained:

> The current condition approach used for both the 2014 modification and for this renewal permit is to establish effluent limits that characterize the water quality of the discharge for the period of record January 1, 2010 through September 30, 2012. Effluent limits are intended to hold the current condition in place from a water quality standpoint, which allow the permittee operational flexibility to change the quantity and quality of water from each outfall, to the extent that these changes do not result in a significant departure from the characterized condition. The Division agrees that these changes in quality can be attributed to a number of operational factors, including reductions and increases in flow from existing sources within the piping network to each outfall, changes in chemistry in groundwater formations from which produced water is currently withdrawn, changes in formations from which groundwater is withdrawn within existing wells, and changes in sources (wells) to the outfall piping network. All of these changes can have a diluting, or concentrating effect on the SAR level and remain both a flexibility and a responsibility for the permittee to manage.

48054 Fact Sheet at 11; 48062 Fact Sheet at 11 (emphasis added). *See also* 48054 Fact Sheet at 8 ("One objective of the establishment of effluent limits set to represent the current condition characterized from January 2010 through September 2013, was to allow these operational and discharge changes to occur only to the extent that they do not result in a decrease in water quality"); 48062 Fact Sheet at 8 (same language). Allowing for operational and discharge changes that do not result in a decrease in water quality is consistent with the Division's past practices in developing limitations to maintain "current conditions." "Current condition" is typically used in the context of temporary modifications. *See, e.g.*, 5 C.C.R. § 1002-38.82 ("the Division will assess the current effluent quality, recognizing that it changes over time due to variability in treatment plant removal efficiency and influent loading from industrial, commercial, and residential sources. One necessary element of an approach to maintain the current condition would be a requirement that the total loading from commercial and industrial contributors be maintained at that level as of the date of adoption of the temporary modification

and that neither the concentration nor the frequency of high concentration shall increase over historic levels and frequency.").

Despite espousing that the new limits would allow the Companies' operational flexibility, the Draft Permits imposed flow limits to specific outfalls, which negates the flexibility the Division highlighted in imposing new limits based on "current conditions." Draft 48054 Permit at 4-5; Draft 48063 Permit at 4-5. The Division explained that because the new EC/SAR "permit limitations were revised to ensure that the 'current condition' was retained, flow limits were added to each outfall." 48054 Fact Sheet at 7; 48062 Fact Sheet at 7 (emphasis added). The Division's explanation for imposing new, more stringent SAR limits while also imposing flow limits flies in the face of the Division's past practice in applying limits that maintain "current conditions."

The purpose of the "current condition" approach is to maintain current environmental standards in the receiving body, allowing the permittee some flexibility in the details of its operations so long as the ultimate outcome is satisfactory. Imposing per-outfall limits, however, with no regard for the actual condition of the receiving body or operational realities, contradicts the very purpose of the "current condition" approach. Years of real-life experience with the XTO's operations in the Raton Basin and water quality data collected from wellheads, outfalls, and at numerous surface water monitoring stations demonstrate that the current condition of the Purgatoire River is clean and healthy and that XTO's continued CBM operations will not adversely impact the River. Such a backward application of the Division's stated methodology is arbitrary and capricious. The Division has the discretion to set the EC and SAR limits at the maximum levels, as proposed by XTO.

Response 29: See response to comments 19 and 20. The Division has enhanced the fact sheet language to provide further clarity regarding the approach used to establish effluent limits for EC and SAR.

Comment 30: J. Applying different EC/SAR requirements and compliance schedules in the Companies' permits and in the New Elk permit is arbitrary and inconsistent.
On the same day the Division issued the Draft Permits for Pioneer and XTO, it issued a Draft Permit for New Elk Coal Company ("New Elk"). Draft Authorization to Discharge, Permit No. CO-0000906 (Feb. 6, 2015). New Elk outfall 001 discharges to the Middle Fork of the Purgatoire River, upstream of outfalls covered by Permit No. CO-0048062. Fact Sheet to Permit No. CO-0000906 at 2 (Feb. 6, 2015) ("906 Fact Sheet"). Because of their close proximity and discharge locations, a comparison of effluent limitations and compliance schedules presented in the Draft Permits shows that New Elk was provided a longer period of time with which to meet the new SAR limitation on its one applicable outfall (001). In terms of SAR, the Division recognized that XTO would not be able to meet the new, lower limits that were effective immediately. In the WQA, the Division noted that New Elk may not be able to consistently meet the limits. WQA at 23. Given these similar compliance scenarios, it would be logical to expect that both permittees would be issued compliance schedules (consistent with the Division's past practice, regulations, and policies). However, only New Elk was granted a compliance schedule for this requirement. The Division's approach to imposing new, more stringent requirements on one permittee and allowing another additional time to comply demonstrates the arbitrary and

unsupported manner in which the Division developed the Draft Permits. Permittees to the same body of water and in the same watershed should be given comparable permit limitations and compliance schedules.

Response 30: Due to an abundance of data collected on the Purgatoire River via the Purgatoire Monitoring Network, and as a result of a robust characterization of effluent quality, *and* a request by XTO and Pioneer, the Division implemented a site specific approach to the implementation of EC and SAR in the associated permits.

The New Elk Mine did not request any deviation from the Irrigation Policy nor have they fully characterized their effluent or instream water quality for EC and SAR, or conducted any studies or reports on soil in the irrigated areas potentially impacted by New Elk discharges. Thus, in the New Elk mine permit, "Statewide" EC and SAR limitations were implemented. The New Elk mine has a discharge dissimilar to CBM operations, implements treatment of effluent, and may be able to meet the current EC limitation.

Further, New Elk Mine discharges to the Middle Fork of the Purgatoire River (COARLA05b) and therefore the EC, SAR, and Iron standards are based on that set of segment standards, and not the Purgatoire River mainstem.

Compliance schedules are applied for each permittee, and consider new or more stringent effluent limitations, ability to meet, treatment or other water management necessary to meet permit limitations, and good faith efforts made by each permittee to comply. Compliance schedules may be different for different dischargers, and do not function to frame timelines based on other dischargers and their operations. For a further discussion of the regulations and purpose associated with compliance schedules, please see the Division's compliance schedule policy (Clean Water Policy 3.

Comment 31: K. EC/SAR limitations should not apply to outfalls that discharge into low- or no flow tributaries.
The Agricultural Policy does not apply to discharge water that does not reach irrigation diversions (no downstream diversions). Discharges from outfalls in the Draft Permits are located in the canyons tributary to the Purgatoire River, in large part to dry arroyos as depicted below.

In accordance with current permit conditions, monitoring is taking place in appropriate locations to protect the agricultural use, namely in the Purgatoire River (where diversions occur) and on parcels that have a long history of irrigation in the Purgatoire valley. The data collected in the Purgatoire River (*see* Figure XIII-1) and field soils demonstrate that there are no EC or SAR issues in the Purgatoire that would cause harm to irrigated acreages located many miles downstream of outfalls which discharge to upstream dry arroyos. *See* EC/SAR Compliance Report (submitted Dec. 2014). Contrary to the Division's concerns, there has been no increasing level of contamination that would threaten to push the system over the target soil and water levels suitable for local crops.

Response 31: See response to comment 21.

Comment 32: L. The Division inappropriately applies Appendix B to the Draft Permit SAR limits. It was inappropriate for the Division to incorporate the LCL approach contained in Appendix B. That policy is intended for the 303(d) impaired waters analysis; neither the intent or scope of that policy applies to determining discharge limits. Moreover, Appendix B was still a draft policy, even for 303(d) impaired waters.

Response 32: The Division determined that use of the 85th percentile statistic to establish an effluent limit and to use of the LCL methodology to determine compliance with the effluent limitation is appropriate for SAR in this case. The division has enhanced the discussion in the fact sheet to provide further clarity.

Note Regarding New Information Regarding the Location of Irrigation Intakes.
The permittees included a map in their comments (Figure XII-1. Location of Active Irrigation Diversions and CBM Outfalls.) The Division contacted the local water commissioner on April 15, 2015 in order to thoroughly go through each and every irrigation intake along the Purgatoire River and tributaries to determine where SAR and EC should apply.

Two major discoveries were made during this investigation:

1. While there is a technically active intake on Burro Canyon, the intake is not functional. Additionally, no active intakes are located downstream of the confluence of Burro Canyon with the Purgatoire River. Therefore, the application of SAR and EC limitations on any outfalls discharging to Burro Canyon and Reilly Canyon were done in error and therefore the SAR and EC limitations for outfalls discharging to Burro Canyon and Reilly Canyon will be removed from the permit (CO0047767).
2. An active intake is located approximately ¾ of a mile upstream of the confluence of Lorencito Canyon with the Purgatoire River. The Ciccone Ditch irrigation has not been actively used since 2004 when a flood washed out the structure.

XTO and Pioneer: Comments on Flow

Note Regarding New Information Regarding Flows on the North Fork of the Purgatoire River.
The Division has clarified information obtained from the local water commissioner, and as a result the flows on the North Fork of the Purgatoire River have changed. The Division revisited flows with the local water commissioner on April 15, 2015. The North Fork is not a zero flow stream as previously reported. Instead, the local water commissioner reported the flows as follows:

Low Flow (cfs)	*Annual*	*Jan*	*Feb*	*Mar*	*Apr*	*May*	*Jun*	*Jul*	*Aug*	*Sep*	*Oct*	*Nov*	*Dec*
1E3 Acute	0.5	1.0	0.5	0.5	1.0	1.0	3.0	3.0	2.5	1.75	1.5	1.5	1.25
7E3 Chronic	0.5	1.0	0.5	0.5	1.0	1.0	3.0	3.0	2.5	1.75	1.5	1.5	1.25
30E3 Chronic	0.5	1.0	0.5	0.5	1.0	1.0	3.0	3.0	2.5	1.75	1.5	1.5	1.25

The WQBELs and ADBACs for the North Fork will be updated in the WQA for all parameters.

Comment 33: The Division did not use reliable, scientific evidence in determining flow estimates throughout the Draft Permits. In fact, the Division is aware that the Companies, with the assistance of Tetra Tech, collected flow data in these segments from April 2010 – December 2014. The Division ignored available data and used the incorrect low flow values to develop many of monitoring and reporting requirements for the Draft Permits for outfalls to Guajatoyah Creek and the South Fork of the Purgatoire River. Flow measurements from the Purgatoire Watershed Monitoring Network Stations should be utilized, as these are accurate, actual measurements conducted with scientific instruments that provide a robust dataset for streamflows. The streamflow data provided to the Division by Tetra Tech in December 2013 will provide higher 1E3, 7E3, and 30E3 low flows for these receiving streams than the estimated low flows currently used in the Draft Permits.

Response 33: The Division acknowledges that the facilities have collected periodic (instantaneous) flow measurements from locations throughout the Purgatoire River basin. However, when determining critical low flow conditions for permit effluent limits, the Division follows the methodology required by Regulation No. 31., as follows;

> The empirically based 30-day average low flow with an average 1-in-3 year recurrence interval (30E3) for chronic standards and the empirically based 1-day low flow with an average 1-in-3 year recurrence interval (1E3) for acute standards, or the equivalent statistically-based flow. And;
>
> The period of record for determining low flows shall be based on a minimum (underline added) of ten years of flow data, except that, when ten years of data is not available, low flows may be determined, on a case-by-case basis, using a period of record of less than ten years. If more than ten years of flow data is available, it may be more appropriate to establish low flow conditions based on a longer period of record to more accurately reflect site specific conditions.

Thus, to obtain a 30 day low flow, with a 1 in 3 year recurrence interval, the Divisions DFLOW model. This model establishes a biologically based annual low flow. The model calculates a harmonic mean for each consecutive, forward rolling, 30-day period. This method establishes an annual low flow which is expected to occur no more than once every three years (e.g. 30E3). Thus, daily flow, typical of flow stations available from a USGS station is needed to represent the river flow regime. One instantaneous sample each month is not sufficient to represent monthly low flow conditions. Further, the flow data needed to evaluate the low flow is a minimum of 10 years of data. As discussed during the 2007 hearing, 31.44 STATEMENT OF BASIS; June 2005 Rulemaking Hearing; Final Action August 8, 2005; Revisions Effective December 31, 2005 and December 31, 2007;

> The Division's current practice is to use the most recent ten years of flow data in establishing low flow conditions. The Commission recognized that, in most instances, the period of record (POR) of available data might be different than ten years. The Commission also recognized that the determination of low flows based on the most recent ten years of flow data could be biased by the predominance of wet or dry cycles within the ten year period, and that such bias could be reduced by the use of a longer period of record. Where the period of available flow data exceeds ten years, the Commission would expect the Division to consider using such POR.

For the renewal permits, for the Purgatoire River mainstem, USGS gage station 07124200 (Purgatoire River at Madrid, CO) was used. This gage station has a daily flow data set from

January 1, 1990 to March 13, 2014, and is a robust mechanism for evaluating the flows in the Purgatoire River. Thus, this methodology remains applicable during this permit term, and is commensurate with regulation and practice. For the Purgatoire mainstem, there is no justification for eliminating this approach to evaluating low flow conditions. Should the permittees elect to alter their instream monitoring network to include daily flow data, that data will be utilized along with other flow data (USGS) in the DFLOW model.

In table IX-1 of the XTO Comment document (page 19), the Companies request the use of flow data from GUA-0.1 for Guajatoyah Creek, PR-37.1 or PR24.9 for the Middle Fork of the Purgatoire River, and SFPR-12.7 or SFPR-0.1 for the South Fork of the Purgatoire River. All of the stations have less than five years worth of data. In addition:

- Guajatoyah Creek and GUA-0.1: Data available from this station were recorded instantaneously on a monthly basis.
- Middle Fork of the Purgatoire River and PR-37.1 and PR-24.9: PR-24.9 data were recorded instantaneous on a monthly basis. PR-24.9 is also located downstream from many discharge points and would be difficult to subtract contributing flow. Thus, this location is not ideal for low flow measurements. As for PR-37.1, the Division stated in the WQA the following: "Please note that the USGS gage station 07124200 (Purgatoire River at Madrid, CO) is exactly the same location as the Purgatoire River Monitoring station PR-37.1, and the same location used in the previous WQA to characterize the Purgatoire River. The Purgatoire Watershed Network maintains PR-37.1, and uses the flow from the USGS gate station 07124200 to supplement the chemical data collected at this location. No additional flow is collected from Station PR-37.1." Therefore the flow used for the Middle Fork and the mainstem does utilize the same location and data available from PR-37.1.
- South Fork of the Purgatoire River and SFPR-12.7 and SFPR-0.1: While SFPR-12.7 is located upstream of the discharges to the South Fork of the Purgatoire River, the data were only recorded via one instantaneous sample on a monthly basis. However, this station is in a good location to characterize upstream flow for the South Fork. Should the permittee elect to install daily flow monitoring at this station above all of the outfalls, flow data will be utilized during the next permit renewal. For SFPR-0.1, data were available as a daily average, but the location of the station is downstream of all discharges to the South Fork of the Purgatoire River.

In sum, the low flow evaluation on the Purgatoire River remains valid and scientifically appropriate due to the nature, volume, and extended period of record of regular flow data. For the remaining waterbodies, because the stations did not provide enough data, or data was in the wrong form, or data was from locations downstream of several discharges, the Division considered, but was not able to utilize this data in calculations prescribed by the WQCC. In lieu of representative daily flow data, the Division's standard operating procedure is to coordinate with the State Office of the Engineer via the local water commissioner for low flow assessments. The State Office of the Engineer is responsible for administering water rights, and conducts regular field visits.

Comment 34: Imposing limits on flow is beyond the Division's statutory authority.

The Water Quality Control Act prohibits the discharge of any *pollutant* unless the discharger obtains a permit. C.R.S. § 25-8-501(1). Pollutants are defined to include dredged materials, dirt, sewage, chemical waste, nutrients, etc. *Id.* § 25-7-103(15). The definition of "pollutant" does not include water flows. Discharge of pollutants means the "introduction or addition of a pollutant into state waters." The waters, and the flow of waters, are not regulated under the Water Quality Control Act. While the Division may impose limits for certain measure of pollutants, it is beyond the Division's authority to set limits on flow. *See Va. Dept. of Transp.*
Pioneer Natural Resources USA, Inc.*v. U.S. EPA*, No. 12-775, 2013 WL 53741 (E.D. Va., Jan. 3, 2013) (finding that the EPA exceeded its statutory authority under the Clean Water Act by establishing a permit limit on the amount of water flowing into a water body).[8] EPA did not appeal the decision. Additionally, after the Virginia court ruled that EPA could not regulate flows, EPA withdrew the flow language from its stormwater permitting guidance. *See* "EPA Withdraws 'flow' Language in New Stormwater Permitting Guidance," INSIDE EPA (March 4, 2015) (*available at* http://insideepa.com/node/176578). Colorado's Permit Regulations only state that the permittee shall *monitor* "the volume of effluent discharged from each outfall." 5 C.C.R. § 1002-61.8(4)(c)(ii). As such, numeric flow limits should be stricken from the Draft Permits.; they may be replaced with "report only" requirements for flow.

Response 34: Flow limits are clearly required in this permit in accordance with the following regulatory provision.

61.8(2) DEFINITION OF EFFLUENT LIMITATIONS
Effluent limitations for each permit will, as a minimum, include the following effluent limitations and standards. ...

> (i) All pollutants limited in permits shall have limitations, standards or prohibitions expressed in terms of concentration and mass or concentration and flow (underline added) except:
>
> (A) For pH, temperature, radiation, or other pollutants which cannot appropriately be expressed by mass;
> (B) When applicable standards and limitations are expressed in terms of other units of measurements; or
> (C) If in establishing permit limitations on a case-by-case basis under 61.8(2)(a)(iv) limitations expressed in terms of mass are infeasible because the mass of the pollutant discharged cannot be related to a measure of operation , and permit conditions ensure that dilution will not be used as a substitute for treatment.
>
> (ii) Pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations.

Thus, effluent limitations, at a minimum, limit either flow and concentration or mass and concentration.

Further, facility effluent flow remains necessary due to the nature of permit limit derivations when dilution is considered and assimilative capacity is incorporated into the permit limits. The importance of establishing a flow limit is highlighted by the fact that in this renewal permit, several outfalls were allocated dilution during some months of the year. Permit limitations are calculated based on facility effluent flow via a mass-balance equation:

$$M_2 = \frac{M_3 Q_3 - M_1 Q_1}{Q_2}$$

Where,
Q_1 = Upstream low flow
Q_2 = Maximum Average effluent flow
Q_3 = Downstream flow ($Q_1 + Q_2$)
M_1 = In-stream background (upstream) pollutant concentrations
M_2 = Calculated WQBEL
M_3 = Water Quality Standard

When a permit limit is derived based on an effluent flow, the 30- day average effluent flow limit ensures that effluent limits are established so that the discharge will not cause or contribute to an exceedance of the standard in the receiving water during low flow conditions. Flow needs to be limited to ensure that the assumptions in the mass balance calculations remain valid.

Additionally, the case cited in the comment does not apply to this situation for three reasons. First, as stated by the court, the issue in that case was, "[d]oes the Clean Water Act authorize the EPA to regulate the level of a pollutant in Accotink Creek by establishing *a TMDL* [total maximum daily load] for the flow of a nonpollutant into the creek?" (emphasis added) *Va. Dept. of Transp. v. U.S. EPA*, 2013 WL 53741, at *5 (E.D. Va., Jan. 3, 2013). The Court's conclusion was limited to the statutory authority for establishing TMDLs, and did not discuss the statutory authority for establishing permit limits, as is incorrectly stated in the parenthetical in the permittee's comment. Specifically, the court stated, "[t]he language of [33 U.S.C.] § 1313(d)(1)(C) is clear. EPA is authorized to set *TMDLs* to regulate pollutants, and pollutants are carefully defined. Stormwater runoff is not a pollutant, so EPA is not authorized to regulate it via *TMDL*." (emphasis added) *Va. Dept. of Transp.*, 2013 WL 53741, at *14-15. Second, the issue in the case was stormwater and not process water. *Id.* at *4-5. The water discharged by the permittee is process water. Finally, this case interprets the federal Clean Water Act, and not the Colorado Water Quality Control Act. While Colorado is an authorized implementing agency for some aspects of the federal clean water program the two legal frameworks are not identical.

XTO and Pioneer: Comments on Mixing Zone Analysis

Comments regarding Permit No. CO0048062:

Comment 35: Outfall 049-A for permit CO0048062 does not directly discharge to the South Fork of the Purgatoire River, therefore it should not be subject to a mixing zone evaluation.

Response 35: The Division originally assigned a mixing zone evaluation when Outfall 049-A was thought to discharge to the South Fork of the Purgatoire River. Considering the permittee

clarified that the discharge location of out fall 049-A is to a tributary of the South Fork of the Purgatoire, the mixing zone evaluation is not required and will be removed from the final permit.

Comments regarding Permit No. CO0048003:

Comment 36: The Regulatory Mixing Zone (RMZ) exceeds the PMZ, indicating that Guajatoyah Creek should be excluded from a mixing zone analysis. Therefore, per Regulation 5 C.C.R. § 1002-31.10(2)(a), outfall 241-A should be exempt from the mixing zone regulations and the requirements for a mixing zone study for this outfall should be removed from the Draft Permit.

Response 36: In examining Table IX-2 of the Mixing Zone Analysis included in the comments, flow in the creek drops to as low as 0.03 cfs. It appears that the permittee performed an evaluation based on the ***average*** flow and not the ***critical low flow*** as required in Regulation No. 31. Further, the permittee did not discuss how or where the RMZ was calculated, or what is was based upon. The evaluation requires the measurement of the channel width at six locations beginning at the point of discharge and extending downstream intervals equal to the bankfull channel width near the discharge. The narrative and tables included does not include this information as all measurements in the table were gathered from only one location (GUA-0.1). Finally, per the Mixing Zone Guidance;

> Because it is impractical for field studies to be restricted to times coinciding with critical low flows, any field determination that is made at the time of flow in the lowest 15th percentile can be used in field studies of the physical mixing zone.

For this facility, the 15th percentile of the data in Table IX-2 (flow column) is 0.2974 cfs, not 2.2 cfs, the flow at which this sample was taken.

No changes to the permit are warranted as a result of this comment.

XTO and Pioneer: Comments on Monitoring Frequency

Comment 37: The Division has imposed highly complex analytical requirements outfall by outfall without adequate justification. The Division's imposition of inconsistent monitoring and reporting requirements is unwarranted and unnecessarily burdensome.

Response 37: Each outfall has its own water quality that needs to be monitored. Instead of requiring quarterly or even monthly testing at each and every outfall, even when a certain parameter does not need such frequent testing at a particular outfall, the Division decided to tailor frequency to each outfall. If the Companies' would like uniform sampling frequencies, then the Division can institute Quarterly sampling across the board.

As for the reporting protocols, the Division is assuming that Companies' are unclear as to why some outfalls are report only while others have limitations assigned. Whether or not a particular outfall has report only or an actual limitation depends upon the reasonable potential analysis. Please refer to the relevant Fact Sheet for the detailed discussion on reasonable potential.

Additionally, for a number of parameters the Division cites the cumulative number of data points for the permits to be over 600 data points. The Division utilized this approach when none of the data points demonstrated reasonable potential in order to expedite the review process. When an outfall produced a result that could demonstrate reasonable potential, the Division honed in and performed the reasonable potential analysis for that outfall.

Comment 38: The Division has included monitoring and reporting requirements for numerous parameters in each of the Companies' five Draft Permits, even though the Division made a quantitative determination of no RP. The Division is requiring semi-annual monitoring when no RP is concluded, and quarterly monitoring when either RP is concluded or when no RP is concluded but the maximum estimated pollutant concentration ("MEPC") is greater than 50% of the maximum allowable pollutant concentration ("MAPC"). The imposition of semi-annual monitoring for parameters that have been found to have no quantitative RP appears arbitrary and excessive. Furthermore, requiring quarterly monitoring and reporting for both parameters with RP and those with no RP but where the MEPC is greater than 50% of the MAPC seems inequitable and does not recognize the lower potential for impact posed by those parameters.

Response 38: The Division has included monitoring to ensure that the quality of the water being discharged by the permittees remains below the point of reasonable potential. The monitoring requirements are consistent with or less stringent than those prescribed in the Division's monitoring policy. Based on the comment the Division has reviewed monitoring frequencies for all parameters and made reductions where appropriate.

Variations with monitoring frequency is in direct relation to the reasonable potential for the ADBAC. If there is reasonable potential for monitoring only for the ADBAC and no reasonable potential for the WQBEL, then the monitoring was set to quarterly. If there is no reasonable potential for the ADBAC and the WQBEL, then the monitoring frequency was set to semi-annual.

Comment 39: Over the course of the five-year permit life, this excessive monitoring would result in the generation of over 20,000 additional data points at an estimated cost of $1.8M to the Companies (Table XIV-1).

Response 39: The Division disagrees with the information included in Table XIV-1. While the Division agrees that additional monitoring will require some additional resources, the information as presented in the table is misleading. For example, assigning a separate vehicle cost, shipping cost, labor cost, and additional number of samples collected for each parameter is misrepresented; many parameters are all tested from the same single sample bottle and does not require the "number of samples" as indicated, and considering it is all collected, transported, and shipped at the same time. Based on the comment the Division has reviewed monitoring frequencies for all parameters and made reductions where appropriate.

Comment 40: Analytical laboratories can extract data on additional metals from prior analyses stored in their Laboratory Information Management System ("LIMS"). For example, the five current permits have required quarterly monitoring of total recoverable iron since 2010. Had the Division communicated to the Companies that they were considering the addition of the total

recoverable form of several metals (*see* Table XIV-1 above) to the Draft Permits, the Companies could have supplied the Division with up to 20 data points (four quarters per year, for five years) for these metals for each outfall. This simple "ask" by the Division could have potentially resolved the RP issue for some of these metals prior to the issuance of the Draft Permits.

Response 40: On page 7 of the permit applications submitted by the permittees, under the heading "Discharge Quality" the application requires the submittal of a number of parameters with the application, including total parameters. This application requirement is included in all industrial applications for waste water discharge to surface water.

The data can also be submitted with the comments, and the Division can evaluate the information and incorporate changes based on new information in the final permit.

The permittee can also submit the data early, before the required monitoring under the permit is completed, as a part of a permit modification request and the Division will evaluate the data for reasonable potential.

XTO and Pioneer: Comments on Temperature

Comment 41: XTO Outfall No. 049A does *not* discharge directly to the South Fork Purgatoire River). Rather, this outfall discharges into a pond on a small ephemeral tributary to the South Fork, and should be reclassified to Segment COARLA06a. After discharge water is retained in this pond, it then must flow approximately 0.15 miles downstream before reaching the South Fork of the Purgatoire River. Because of the residence time in the pond, and fact that any water that does escape the pond must flow 0.15 miles prior to reaching Segment 5b, the temperature of this water is expected to normalize by the time the discharge water reaches the South Fork of the Purgatoire River. Consequently, all temperature monitoring requirements in Draft Permit No. CO-0048062 (Alamocito) should be eliminated.

Response 41: Due to the information provided by the permittee, temperature monitoring requirements and instream monitoring requirements for temperature for 049-A for CO0048062 will be removed from the permit. Please also see the other comments related to temperature.

Comment 42: As illustrated below, Pioneer Outfall No. 241 does *not* discharge directly to Guajatoyah Creek. Rather, this outfall discharges to a small ephemeral tributary at a location approximately 0.34 miles above the confluence with Guajatoyah Creek. The temperature of this water is expected to normalize by the time it flows 0.34 miles to Guajatoyah Creek. Consequently, all temperature monitoring requirements in Draft Permit No. CO-0048003 (West Spanish Peaks) should be eliminated because the Division has not established that such requirements are warranted.

Response 42: Due to the information provided by the permittee, temperature monitoring requirements and instream monitoring requirements for temperature for 241 for CO0048003 will be removed from the permit. Please also see other comments related to temperature.

Comment 43. B. The Draft Permits impermissibly impose temperature monitoring stations with locations "to be determined" above permitted outfalls.

Response 43: Given the updated information provided by the permittee regarding discharge locations, in stream temperature monitoring stations with locations "to be determined" will be removed from the permit

XTO and Pioneer: Comments on Reasonable Potential

Comment 44: The entire RP analysis should be revisited using all available CBM wellhead water quality data (COGCC), outfall water quality data, surface water quality data, and surface water flow data.

Response 44: Only discharge or outfall water quality data would be representative given that the permittee pipes multiple wells to single discharge points. In addition, changes in the formation from which the wells piped to a discharge are generating produced water, and other operational changes, are considerations in determining the representativeness of the data. The permittee can provide any existing data, including data that has been submitted to OGCC for consideration for use in permitting actions if the permittee determines that data to be representative of the discharge. This data should be submitted with the application process.

Comment 45: The Division's Reasonable Potential analysis is inherently flawed. The Division should have utilized the Purgatoire River Watershed Monitoring Network data when evaluating the "Pollutants of Concern" in the WQA. The Division should have incorporated these data into the reasonable potential evaluation. The Division should also revise the low flow analysis for Guajatoyah Creek and the South Fork Purgatoire River using flow data collected from Purgatoire River Watershed Monitoring Network stations.

Response 45: Please see Comment/Response 33. The instream data that was collected was used for flow, SAR, EC, WET, and bicarbonate. Like flow, the Division must characterize the upstream ambient condition for the purpose of determining assimilative capacity. The instream data is also valuable for assessment of the stream condition given the influence of the discharge.

Comment 46: A primary argument against testing for these parameters centers around additional costs for such testing. For example, the testing for total recoverable molybdenum will cost the Companies' an additional $109,000 (approximate).

Response 46: Please see Comment/Response 39.

Comment 47: No environmental benefit would result from the expensive and time consuming collection, analysis, and evaluation for a variety of parameters.

Response 47: To ensure a robust data set for each individual outfall and to monitor any changes in the variable source water, the Division has determined that the semi-annual monitoring for certain parameters is warranted, particularly in the case where a reasonable potential analysis was based on one sample from several years ago or if one of the outfalls happened to have an

elevated level of a particular contaminant. The permittee makes this same argument pertaining to the variability to the source water in regard to SAR and EC. The Division applies the same process for the metals. For most of the parameters, data collection requires very little extra effort, considering most of these metals can be tested from the same bottle as the total recoverable iron bottle.

Conduction sampling that provides essential data does provide an environmental benefit through providing critical information that informs decisions about the levels of pollution control that are necessary to protect the classified uses and water quality standards. When the Companies' change operations in any way that may have a negative impact on the quality of water being discharged from the outfalls, the Division will have approximately 10 data points per outfall per parameter upon permit renewal to assess the "reasonable potential" for the parameters in the discharge to cause or contribute to a water quality standards violation.

Comment 48: The Companies provided a non-inclusive discussion of many parameters and why the reasonable potential was flawed. On page 87 of XTO's comment letter and on page 94 of Pioneer's comment letter, the Companies request the removal of monitoring and/or reporting requirements for a number of parameters.

For XTO: Delete monitoring and/or reporting requirements for arsenic (TR), boron, iron (TR), beryllium, cadmium (TR & PD), chromium, copper (TR & PD), lead (TR & PD), manganese (TR & PD), molybdenum (TR), mercury, nickel (TR & PD), radium-226 and 228, selenium (TR & PD), strontium-90, and zinc (PD).

For Pioneer: Delete monitoring and/or reporting requirements for arsenic (TR), boron, iron (TR), beryllium, cadmium (TR & PD), chromium, copper (TR & PD), lead (TR & PD), manganese (TR & PD), molybdenum (TR), mercury, nickel (TR & PD), radium-226 and 228, selenium (TR & PD), strontium-90, and zinc (PD).

Response 48:
Total Recoverable Arsenic: Applicable standards for COARLA05b will be in effect for total recoverable arsenic when the temporary modification expires on 12/31/2021. For those outfalls that reach stream segment COARLA05b, the Division requires periodic monitoring over the life of the renewal permit in order to obtain enough data to be able to conduct a future reasonable potential analysis. Therefore, total recoverable arsenic monitoring will not be removed from the permit. Considering the total recoverable arsenic sample can be obtained at the same time as total recoverable iron, and because arsenic was not eliminated as a pollutant of concern, semi-annual monitoring remains reasonable and applicable during the permit term.

Boron: Boron has been, and continues to be, a parameter concern for all of the permits, due to boron in the effluent. Monitoring is required to evaluate variations in effluent and for the purposes of future reasonable potential determinations (See Section VII of the respective fact sheets). Thus monitoring for total boron will remain in some of the permits as discussed below. However, the Division reconsidered the monitoring frequency at those outfalls with a determination of no reasonable potential for both the WQBEL and the ADBAC, and reduced the monitoring frequency.

CO0048062: Outfalls 022G, 024G, 007G, and 037G all have at least one two year rolling average above half of the proposed ADBAC of 1.1 mg/l and a statistical analysis was performed to determine quantitative reasonable potential, boron remains a parameter of concern for this facility. However, for the remaining 34 outfalls that have a determination of no reasonable potential for both the WQBEL and the ADBAC, reporting requirements have been decreased from semi-annual to annual reporting frequency. Reducing effluent monitoring for 34 outfalls from semi-annual to annual reduces the sampling 34 times for this parameter.

CO0047767: For the reasonable potential analysis, a determination of no reasonable potential for all outfalls was made for both the WQBEL and the ADBAC for all outfalls. For this permit, considering a determination of no reasonable potential was made for all outfalls based on current and relevant data, as a result the reporting requirements will be removed. This removes the sampling requirement and associated sampling costs for approximately 40 outfalls for this parameter.

CO0047776: For outfalls 005 and 022, where an reasonable potential "monitor" determination has been made, quarterly monitoring will be retained. For the remaining five outfalls that have a determination of no reasonable potential for both the WQBEL and the ADBAC, the frequency of reporting requirements have been decreased to annual reporting. Reducing effluent monitoring for five outfalls from semi-annual to annual reduces the sampling from tem to five times per year for this parameter.

CO0048003: For the reasonable potential analysis, a determination of no reasonable potential for all outfalls was made for both the WQBEL and the ADBAC for all outfalls. For this permit, considering a determination of no reasonable potential was made for all outfalls based on current and relevant data, as a result the reporting requirements will be removed. This removes the sampling requirement and associated sampling costs for semi-annual sampling events for all 3 outfalls for this parameter.

CO0048054: A reasonable potential determination has been made for the ADBAC for Outfalls 010A, 016A, 018A, 040A, 047A, 050-A, 068A, 070A, 073-A, 084A, 036A, and 028A. Thus, quarterly monitoring remains warranted. However, for the remaining 27 outfalls, a determination of no reasonable potential was made for both the WQBEL and the ADBAC, therefore the reporting requirements are decreased from quarterly to annual. This will be a cost savings of 117 samples (down from 156 to only 39) per year.

Beryllium: Beryllium monitoring was not intended to be in any permit due to lack of reasonable potential, but was inadvertently added to permit CO0048054. All beryllium limitation requirements will be removed from permit CO0048054.

Cadmium, TR:

CO0048062: Only older well data from a different facility was available at the time of the previous permit action for the reasonable potential analysis. Because several wells screened at different depths can contribute to the effluent, the Division requires a more

substantial, recent, and relevant data set to be able to conduct a reasonable potential analysis. Thus, the requirement to sample the effluent for total recoverable cadmium will remain in the permit, which will provide data that will characterize the effluent, however the sampling frequency will be decreased to annual instead of semi-annual.

CO0047767: The reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008 on 31 source wells (not the outfalls themselves.) As several wells screened at different depths can contribute to the outfalls, the Division requires a more substantial and relevant data set to be able to conduct a reasonable potential analysis. Thus, the requirement to sample the effluent for total recoverable cadmium will remain in the permit, which will provide data which will characterize the effluent, however the sampling frequency will be decreased to annual instead of semi-annual.

CO0047776: Total recoverable cadmium was not required for the draft permit. However, during public notice, the facility clarified the locations of all outalls (except 022A) as discharging to *tributaries* of Lorencito Canyon (COARLA06a) instead of directly to Lorencito Canyon. Segment COARLA06a has a total recoverable cadmium standard associated with the segment, whileCOARLA04b, does not have a total recoverable cadmium standard. Thus, because this discharge is to a tributary of the Lorencito, the Division must conduct a reasonable potential analysis for total recoverable cadmium for outfalls 005A, 010A, 027A, 059A, 075A, and 076A. Thus, annual monitoring for this parameter has been added for these outfalls, due to this change in discharge location.

As with permit CO0047767, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008 on unidentified outfalls. The Division requires a more substantial data set for a reasonable potential analysis.

CO0048003: Total recoverable cadmium was not required for the draft permit.

CO0048054: For the previous permitting action, total cadmium results were available from the wells in the Lorencito basin. All 90 were all under the reporting limit of 5 µg/l. As the WQBEL is 10 µg/l, no limitations are required. Even though the PQL for this parameter is 1 ug/l, since there is ample data (both total recoverable from this well field, and potentially dissolved from the effluent—both were non-detect) that demonstrates there is no RP at 10 ug/l. Further, potentially dissolved cadmium will be monitored during the permit term. Thus monitoring for TR Cd has been removed from the final permit for this facility. This change will reduce sampling from 74 times per year per parameter spread over the 37 outfalls down to only 37 per parameter per year.

Cadmium, PD: The Division re-examined the reasonable potential analysis for all permits. Considering all reasonable potential analyses were conducted using old total recoverable cadmium data, oftentimes not collected at the discharge points but rather at a single well head or at a different location, the Division maintains that it is necessary to monitor for potentially dissolved cadmium, rather than solely total recoverable at an elevated PQL (50 ug/l) compared to a WQBEL for dissolved cadmium of ADD. Thus, monitoring for this parameter in the

appropriate form of the data at the proper PQL remains warranted in order to conduct a statistical reasonable potential analysis.

The analysis is similar as the analysis of total recoverable cadmium, and monitoring requirements will be decreased from semi-annual to annual. This will be a cost savings of 127 samples (down from 254) per year for all 127 outfalls for all the Companies'.

Chromium

Comment: To meet a trivalent chromium reporting requirement, two separate analyses must be performed at each location. Hexavalent chromium is not stable and generally has a short (24-hour) holding time. Collecting samples for hexavalent chromium analysis has proven problematic for the Companies as samples must be transported from distant outfall locations in the watershed to the overnight courier's offices in Trinidad. Additionally, access restrictions during the fall and spring hunting seasons prohibit the Companies from starting sampling activities until 10:00 am and, with the 24-hour hold time and taking special delivery into consideration, the Companies are limited to sampling only a few hours a day during several months of the year. If monitoring is warranted, then it should be for total (unspeciated) chromium.

Response: Please see the RP evaluation below for this parameter, hexavalent chromium has been removed from this permitting action. In various permits, as indicated below, the trivalent form, or unspeciated form may still be applicable.

CO0048062: Considering that there was recent effluent data from the outfalls for this facility and all results were below detection (under 10 ug/l) compared to the WQBELs of 897 ug/l and 234 ug/l, and the ADBACs of 18 ug/l and 38 ug/l, the Division will remove monitoring for all forms of chromium from the permit at this time.

CO0047767: As with most parameters for this facility, there was effluent data from only one sampling event, conducted in March2008. The Division requires a more substantial data set to conduct an RP analysis from current outfalls.

CO0047776: As with most parameters for this facility, the reasonable potential analysis was conducted based upon effluent results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

CO0048003: As with most parameters for this facility, the reasonable potential analysis was conducted based upon effluent results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

CO0048054: Total Recoverable Trivalent - The reasonable potential analysis was based on older well data. The Division requires recent and a more substantial data set of the

effluent to fully evaluate and determine reasonable potential. Therefore the reporting requirements for TR Cr+3 will remain in the permit.

For potentially dissolved chromium, all results for this facility were recent and all below detection and limitations and reporting were removed during the drafting of the renewal permit.

Copper, TR and PD

CO0048062
Potentially Dissolved- The data was recent, from the outfalls for this facility, and all results were below detection [(all data reported after March 2010 used a detection limit of 5µg/l (during 2011) and then 1µg/l (2012 and afterwards)] in comparison to the chronic WQBELs of 14 ug/l and 30 ug/l, the acute WQBELs of 22 ug/l and 45 ug/l, and the ADBACs of 2.7 ug/l and 3.9 ug/l). However, two outfalls demonstrated reasonable potential for the ADBAC for dissolved copper. Therefore the proposed limitations and/or reporting requirements will remain for this facility. No changes will be made.

Total Recoverable- All results for this facility were recent and all below detection and limitations therefore reporting will be removed for all 38 outfalls.

CO0047767
Potentially Dissolved/Total Recoverable- The reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis. However, the Division will grant a lower sampling frequency of annual for both potentially dissolved copper and total recoverable copper.

CO0047776:

Potentially Dissolved- The reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

Total Recoverable – Due to an update to the discharging location of six of the seven outfalls in the comments by the Companies, six outfalls are now discharging to tributaries (COARLA06a) to Lorencito Canyon instead of Lorencito Canyon itself (COARLA04b), total recoverable copper is now applicable (COARLA06a) and annual reporting will be added to the permit for outfalls 005A, 010A, 027A, 059A, 075A, and 076A.

CO0048003:

Potentially Dissolved- The reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires

a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis. However, the Division will reduce the sampling frequency for potentially dissolved copper from semi-annual to annual.

CO0048054:

Potentially Dissolved- As detailed in the Fact Sheet, each outfall was evaluated for reasonable potential. A number of outfalls exhibited a reasonable potential for potentially dissolved copper for the WQBEL and the ADBAC. Therefore the proposed limitations and/or reporting requirements will remain for this facility. No changes will be made.

Total Recoverable- No reporting requirements were required for total recoverable copper.

Lead, TR and PD

CO0048062:

Potentially Dissolved- As detailed in the associated Fact Sheet, each outfall was evaluated for reasonable potential. For a number of outfalls, the previous permitting data was for total recoverable lead and the detection limit was above the potential limitations. For other outfalls, a determination of reasonable potential was made for the WQBELs and the ADBACs. Therefore, the limitations and the reporting in the draft permit will remain. No changes are made as a result of this comment.

Total recoverable- All results for this facility were recent and were all below detection and limitations, therefore, the Division removed monitoring for this parameter for 38 outfalls in the final permit.

CO0048054:

Potentially Dissolved- As detailed in the associated Fact Sheet, each outfall was evaluated for reasonable potential. A determination of reasonable potential was made for two of the outfalls and therefore limitations and reporting requirements in the draft permit remain warranted. No changes are made for potentially dissolved lead.

Total Recoverable -No reporting requirements were required for total recoverable lead.

CO0047767:

Potentially Dissolved/Total Recoverable- The reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

CO0048003:

Potentially Dissolved- The reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

CO0047776:

Potentially Dissolved- The reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

Total Recoverable- Six of the seven outfalls are now discharging to tributaries (COARLA06a) to Lorencito Canyon instead of Lorencito Canyon itself (COARLA04b), total recoverable lead is now applicable (COARLA06a) and annual reporting will be added to the permit for outfalls 005A, 010A, 027A, 059A, 075A, and 076A.

Manganese, TR and PD - Regarding the comment that there is no water quality standard for total recoverable manganese in Segment COARLA6a or the downstream segment, COARLA5 the Division would like to clarify that stream segment "COARLA5" does not exists. The Division assumes that the permittee meant COARLA05a or COARLA05b. Regardless, the permittee is correct that no standard exists for total recoverable manganese on these segments. As such, all monitoring or limitations for total recoverable manganese will be removed from all permits. Removing quarterly monitoring from 127 outfalls will save the Companies' from paying for 508 total recoverable manganese samples per year.

CO0047767: Potentially dissolved manganese was not required for this facility.

CO0048054: Potentially dissolved manganese was not required for this facility.

CO0048062: Potentially dissolved manganese was not required for this facility.

CO0047776: The reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis. However, the Division will reduce the sampling frequency to annual for potentially dissolved manganese.

CO0048003: The reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis. However, the Division will reduce the sampling frequency to annual for potentially dissolved manganese.

Molybdenum, TR - The permittee cites data results (one sample) obtained in 2003 from unidentified outfalls from Pioneer to support the request to decrease the frequency of monitoring for molybdenum from semi-annual to "a less intensive monitoring and reporting program." The Division was not supplied with this information along with the permit application, nor in subsequent data submissions. Further, no information on where (wells, outfalls, etc.) the data was obtained, or any rationale as to why this data is still applicable, considering the variability of the operations and the source water. A one-time sampling event 12 years ago from an outfall that may have since shut down (or the well which supplied the source water has been shut down) does not adequately characterize molybdenum in the source water, or effluent. The semi-annual monitoring is not an extra burden as the permittee will be sampling for total recoverable iron quarterly. Considering that total recoverable molybdenum is analyzed from the same sample aliquot, collecting the molybdenum sample at the same time, by the same personnel, in the same truck, and shipping in the same cooler to the lab, the Division has determined that these sampling requirements are not unreasonable. This semi-annual sampling requirement remains warranted, and no changes have been made for total recoverable molybdenum.

Mercury, T

CO0047767: For outfall 096-A, a qualitative determination of reasonable potential was made as the data result for this outfall was greater than half of the potential limitation. The limitation requirement for this outfall will not be removed. As the data for the facility is limited, the Division requires a more substantial data set to fully determine reasonable potential at all outfalls. Limitations and/or reporting will remain in the permit. No changes will be made.

CO0048062: Considering the determination of no reasonable potential was based on a single sampling event from 2010 on only 10 outfalls, the Division requires a more substantial data set to determine reasonable potential. Reporting requirements will remain in the permit. No changes will be made.

CO0047776: Considering the determination of no reasonable potential was based on a single sampling event from 2010 on only 1 outfall, the Division requires a more substantial data set to determine reasonable potential. Reporting requirements will remain in the permit. No changes will be made.

CO0048003: Considering the determination of no reasonable potential was based on a single sampling event from 2010 on two outfalls, the Division requires a more substantial data set to determine reasonable potential. Reporting requirements will remain in the permit. No changes will be made.

CO0048054: Considering the determination of no reasonable potential was based on a single sampling event from 2010 on only 10 outfalls and the analysis was not conducted using low-level Hg, the Division requires a more substantial data set to determine reasonable potential. Reporting requirements will remain in the permit. The monitoring is semi-annual. No changes will be made.

Nickel, TR and PD

CO0048062: No results were available from this facility and the reasonable potential analysis was based on data from another facility. As stated in the Fact Sheet, since this data is from another facility from over 5 years ago, due to recent variations in effluent values for other parameters, and for the purposes of future reasonable potential determinations, monitoring is required.

As for total recoverable nickel, no data was available at all.

All monitoring for these parameters will remain in the permit, however the sampling frequency will be reduced to annual.

CO0047767: As with most parameters for this facility, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

CO0047776: As with most parameters for this facility, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

For total recoverable nickel, now that six of the seven outfalls are now discharging to tributaries (COARLA06a) to Lorencito Canyon instead of Lorencito Canyon itself (COARLA04b), total recoverable nickel is now applicable (COARLA06a) and annual reporting will be added to the permit for outfalls 005A, 010A, 027A, 059A, 075A, and 076A.

CO0048003: As with most parameters for this facility, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

CO0048054: No results were available from this facility and the reasonable potential analysis was based on data from another facility. As stated in the Fact Sheet, since this data is from another facility from over 5 years ago, due to recent variations in effluent values for other parameters, and for the purposes of future reasonable potential determinations, monitoring is required.

As for total recoverable nickel, no data was available at all.

All monitoring for these parameters will remain in the permit, however the sampling frequency will be reduced to annual. This change will reduce sampling from 74 times per year per parameter spread over the 37 outfalls down to only 37 per parameter per year.

Radium 226-228

CO0048062: Several of the data points are above the potential ADBAC and therefore, additional monitoring from all outfalls for the duration of the permit is warranted in order to determine reasonable potential for the ADBACs. Considering the reasonable potential determination was based on a single sampling event from 2010 on only selected outfalls, the Division requires a more substantial data set to determine reasonable potential. Annual reporting requirements will remain in the permit. No changes will be made.

CO0047767: Considering the determination of no reasonable potential was based on a single sampling event from 2010 on 15 outfalls, the Division requires a more substantial data set to determine reasonable potential. Annual reporting requirements will remain in the permit. No changes will be made.

CO0047776: Considering the determination of no reasonable potential was based on a single sampling event from 2010 on only 1 outfall, the Division requires a more substantial data set to determine reasonable potential. Annual reporting requirements will remain in the permit. No changes will be made.

CO0048003: Considering the determination of no reasonable potential was based on a single sampling event from 2010 on two outfalls, the Division requires a more substantial data set to determine reasonable potential. Annual reporting requirements will remain in the permit. No changes will be made.

CO0048054: All 10 outfalls that were sampled reported detectable levels of radium, and for outfall 049A a qualitative determination of reasonable potential was made as the data result for this outfall was greater than the potential limitation. The limitation requirement for this outfall remains applicable. As the data for the facility is limited, and radium is detected in several outfalls within this facility, semi-annual effluent sampling throughout the field is required to characterize outfall effluent concentrations of radium. Limitations and/or reporting remain in the permit. No changes are made as a result of this comment.

Selenium, TR and PD

CO0048062: The determination of no reasonable potential was made based on recent data for both total recoverable selenium and for potentially dissolved selenium. The Division will not require more data to conduct further investigations, therefore all selenium reporting requirements will be removed from the permit.

CO0047767: As with most parameters for this facility, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

CO0047776: As with most parameters for this facility, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in

March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

For total recoverable selenium, now that six of the seven outfalls are now discharging to tributaries (COARLA06a) to Lorencito Canyon instead of Lorencito Canyon itself (COARLA04b), total recoverable selenium is now applicable (COARLA06a) reporting will be added to the permit for outfalls 005A, 010A, 027A, 059A, 075A, and 076A.

CO0048003: As with most parameters for this facility, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis.

CO0048054: As detailed in the permit, each outfall was examined for reasonable potential. In summary, a number of outfalls had reasonable potential for potentially dissolved selenium for the WQBEL and the ADBAC. Therefore the proposed limitations and/or reporting requirements will remain for this facility. No changes will be made.

The Division disagrees with the claim that there is no data for total recoverable selenium. As outlined in the fact sheet, the previous permitting action conducted a reasonable potential analysis for potentially dissolved selenium based on total selenium (See Fact Sheet for CO0048054, page 12, issued December 30, 2009.) Therefore this is not a new parameter and the Division has enough evidence to suggest that the outfalls should be able to meet the new limitation for total recoverable selenium. Reporting requirements will remain and no changes to the permit will be made.

Strontium-90

CO0048062: Monitoring was not required for this permit based on previous sampling events.

CO0047767: For outfall 096-A, a qualitative determination of reasonable potential has been made as the data result for this outfall was greater than half of the potential limitation. The limitation requirement for this outfall will not be removed. As the data for the facility is limited, the Division requires a more substantial data set to fully determine reasonable potential at all outfalls. Limitations and/or reporting will remain in the permit. No changes will be made.

CO0047776: Monitoring was not required for this permit based on previous sampling events.

CO0048003: Monitoring was not required for this permit based on previous sampling events.

CO0048054: Monitoring was not required for this permit based on previous sampling events.

Zinc, PD

CO0048062: Considering that the data available is both recent and numerous, and that the data is clearly well below proposed limitations, the Division will remove this parameter as a pollutant of concern and monitoring will be removed from the permit.

CO0047767: As with most parameters for this facility, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis. However, the Division will grant a lower sampling frequency of annual for potentially dissolved zinc.

CO0047776: As with most parameters for this facility, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis. However, the Division will grant a lower sampling frequency of annual for potentially dissolved zinc.

CO0048003: As with most parameters for this facility, the reasonable potential analysis was conducted based upon results from a one-time sampling event, conducted in March2008. The Division requires a more substantial data set from current outfalls to be able to conduct a reasonable potential analysis. However, the Division will grant a lower sampling frequency of annual for potentially dissolved zinc.

CO0048054: No results were available from this facility and the reasonable potential analysis was based on data from another facility. As stated in the Fact Sheet, since this data is from another facility from over 5 years ago, due to recent variations in effluent values for other parameters, and for the purposes of future reasonable potential determinations, monitoring is required. However, the Division will reduce the sampling frequency from semi-annual to annual for potentially dissolved zinc. This change will reduce sampling from 74 times per year per parameter spread over the 37 outfalls down to only 37 per parameter per year.

Additional Parameters – Chloride

Comment: Despite accepting an Alternatives Analysis for Chloride that addressed the infeasibility and negative consequences of adopting a "strict" chloride limit (see Authorizations to Discharge for CO-0048054 and CO-0048062 (eff. April 1, 2014)), these chloride limits have been retained for some outfalls, particularly in Draft Permit No. CO-0048062 (outfall 21G). In these cases, it is likely the Division applied these limits due to a misunderstanding of reported isolated cases of higher-than-typical chloride levels. Two-year average chloride limit are not appropriate and will be deleted.

Response: As per the Alternatives Analysis for chloride, the ADBEL applied to the outfalls for CO0048062 is 287 mg/l. This alternatives analysis has no effect on calculated WQBELs. The

Division retained the ADBEL requested by the permittee. The addition of limitations or reporting requirements is clearly outlined in the Fact Sheet. For example, 021G had demonstrated reasonable potential, therefore limitations are included in the permit.

The permittee calls the higher chloride levels reported in the DMRs "higher-than-typical" and "isolated." However, as per the permittee's argument regarding SAR and EC, the elevated levels should not be treated as isolated. Additionally, all data must be considered when making a reasonable potential determination. As per the Reasonable Potential Policy:

> If the permittee believes that the data set used in the RP analysis contains values that are inconsistent with the remainder of the data (outliers) then, at the permittee's request, the permit writer may exclude the outlier from the calculation of the CV and the subsequent calculation of the maximum estimated pollutant concentration provided that: the permittee can provide valid statistical analysis that the value is a statistical outlier.
>
> It is important to note that the outlier is only excluded from the statistical portion of the RP analysis-which is a tool to help predict future pollutant concentrations. Outliers are still included in the comparisons to the maximum allowable pollutant concentrations…

The permittee is welcome to provide such statistical evidence for each individual outfall that any elevated results in the data set are outliers, but this will only impact the calculation of the coefficient of variation (which is used to calculate the maximum estimated pollutant concentration). All data will be compared to the maximum allowable pollutant concentration.

No changes to chloride will be made in any of the permits until such proof is provided.

Comment: A quantitative determination of no RP was concluded in Permit No. CO-0047767 for chloride at outfalls 183A and 202A because the MEPC was less than the MAPC, and therefore no limitations were required. 47767 Fact Sheet at 36. However, the MEPC was greater than 50% of the MAPC and quarterly monitoring is included in the Draft Permit. Quarterly monitoring is also imposed at outfalls where RP was concluded and a limit is imposed. These quarterly monitoring requirements are excessive. No environmental benefit would result from the expensive and time consuming collection, analysis, and evaluation (by both Companies and the Division) of the hundreds of data points generated by this requirement, with total estimated costs over $200,000.

Response: The standard monitoring frequency for a minor industrial facility for similar parameters (sulfide, boron) with no federal effluent guideline is monthly. As it stands, the Division is providing relief based on the remote location of the outfalls by allowing a reduced monitoring frequency of quarterly. No changes will be made to the monitoring frequency for chloride for these outfalls.

Comment: In addition, despite accepting an Alternatives Analysis for Chloride that addressed the infeasibility and negative consequences of adopting a strict chloride limit (*see* Authorizations

to Discharge for CO-0047767, CO-0047776, and CO-0048003 (eff. April 1, 2014)), stricter chloride limits have been retained for some outfalls, particularly in Draft Permit Nos. CO-047776 (outfalls 005A, 117A, and 22A), and CO-0047767 (outfalls 60A, 287A, and 239A). In these cases, it is likely the Division applied these limits due to a misunderstanding of reported isolated cases of higher-than-typical chloride levels. Two-year average chloride limit are not appropriate and must be deleted.

Response: As per the Alternatives Analysis for chloride, the ADBEL applied to the outfalls for CO0048062 is 287 mg/l. This alternatives analysis has no effect on calculated WQBELs. The Division retained the ADBEL requested by the permittee. The addition of limitations or reporting requirements are clearly outline in the Fact Sheet. For example, 021G had demonstrated reasonable potential and therefore limitations are included in the permit.

The permittee calls the higher chloride levels reported in the DMRs "higher-than-typical" and "isolated." However, as per the permittees argument regarding SAR and EC, the elevated levels should not be treated as isolated. Additionally, all data must be considered when making a reasonable potential determination. As per the Reasonable Potential Policy:
If the permittee believes that the data set used in the RP analysis contains values that are inconsistent with the remainder of the data (outliers) then, at the permittee's request, the permit writer may exclude the outlier from the calculation of the CV and the subsequent calculation of the maximum estimated pollutant concentration provided that: the permittee can provide valid statistical analysis that the value is a statistical outlier.

It is important to note that the outlier is only excluded from the statistical portion of the RP analysis-which is a tool to help predict future pollutant concentrations. Outliers are still included in the comparisons to the maximum allowable pollutant concentrations.

The permittee is welcome to provide such statistical evidence for each individual outfall that any elevated results in the data set are outliers, but this will only impact the calculation of the coefficient of variation (which is used to calculate the maximum estimated pollutant concentration). ALL data will be compared to the maximum allowable pollutant concentration.

No changes to chloride will be made in any of the permits until such proof is provided.

Additional Parameters – Iron

Comment: The Division's request for quarterly monitoring and reporting requirements again for **iron** during the Draft Permit term is excessive and unreasonable, resulting in an estimated cost of $160,415 to the Companies.

Response: Standard monitoring frequency for a minor industrial facility for metals with no federal effluent guideline is monthly. As it stands, the Division is providing relief based on the remote location of the outfalls by allowing a reduced monitoring frequency of quarterly. No changes will be made to the monitoring frequency for iron for the permits.

Additional Parameters – Sulfide

Comment: Part I D. of the permits indicates that the PQL for sulfide is 0.2 mg/L. Consequently, obtaining sulfide data from the outfalls over the life of the permit that is at or below the stream standard of 0.002 mg/L is not practical. The Division should revise the WQA and Fact Sheets to acknowledge this technical issue. In the event that all data collected over the next five years are reported as below detection limit *but* the detection limit exceeds the stream standard, the Division should also describe how these data will be evaluated and what decision(s) the Division will make based on these data during the next permitting cycle.

Response: Clarification will be provided in the Fact Sheet and the Permit.

PERMIT SPECIFIC COMMENTS PERTAINING TO PERMIT NO. CO0048062

XTO: Comments on the Permit

Comment 1: Part I A.1., page 3. The table of permitted features in the Draft Permit contains numerous inaccuracies. The table below presents more accurate coordinates and sampling point descriptions for the outfalls. All coordinates are "end of pipe." Coordinates or parameters that have been changed are highlighted in yellow.

Response 1: The corrections have been made.

Comment 2: Part I A.1, page 3. Outfall 079H is listed as a permitted feature and has flow, EC, and SAR limits, and is described in the chronic WET testing section (Part I B.3), but does not have any other limits in the Draft Permit. The Division should revise the permit such that outfall 079H has the same effluent parameters as outfall 080H.

Response 2: Outfall 080H was listed twice this has been corrected.

Comment 3: Part I A.1., page 4. The description following the Sampling Points table is inaccurate. The sentence currently reads, in part: "The location(s) provided above will serve as the point(s) of compliance for this permit and are appropriate as they are located after all treatment and prior to discharge to the receiving water." This is a substantial modification from the 2014 version of the Permit. In 2014, XTO commented and the Division agreed upon language in the prior permit that should be used again here. The description should be replaced to read: "All samples shall be taken after final treatment, before the effluent joins or is diluted by any other waste stream, substance, body of water, and prior to mixing with the receiving stream." This revised language acknowledges that treatment occurs after the pipe, such as ponds or settling, provide treatment.

In the Draft Permit for New Elk, also issued February 6, 2015 for the same watershed, the compliance points were multiple outfalls were described as "Outfall [XX] following treatment in pond [XXX]." It is reasonable for the Division to identify XTO's compliance points for discharges the same as reflected in the 2014 version of the Permit. The New Elk permit confirms that the descriptions used are suitable and appropriate where there are features below the pipe and before the discharge reaches waters of the State.

Response 3: The Division has revised the permit language to conform to the language in the previous permit.

Comment 4: Part I.A.2, pages 4-5. Without waiving our contention that limits on flow are beyond the scope of the Division's regulatory authority (see Comment Letter Section VII), XTO does offer that it may not be objectionable if flow limits are included in the final permit based on total flows for each tributary. The following sentence would be added to this section to allow for operational flexibility, "Flows for outfalls have been combined where the outfalls are on the same segment and the combined outfall is at a point identified in this permit." If the Division elects this option, please confer with XTO on the outfalls to be combined, language describing the combined flow limits, and the new point of compliance. There are physical obstacles and legal impediments to points of compliance in some terrain and on property not controlled by XTO

Response 4: Flow limits for each outfall have been retained in the permit. This is discussed further in the fact sheet and responses to other comments.

Comment 5: Part I A.2., Page 4. Table referring to Permitted Feature UST1. The text should clearly state that reporting at this location is limited to "Report" for the duration of the permit as described in the associated Fact Sheet. See main comment document

Response 5: The Table for Permitted Feature/Limit Set UST1 clearly states that the requirements are for report only.

Comment 6: Part I A.2, pages 10-11. Outfall 080H is listed twice, on pages 10 and 11 of the Draft Permit. All references to outfall 080H on page 11 should be deleted, otherwise conflicting requirements apply to this outfall.

Response 6: Outfall 080H was listed twice this has been corrected.

Comment 7: Part I A.2, pages 11-12. Outfall 040A is listed twice, on pages 11 and 12 of the Draft Permit. All references to outfall 040A on page 11 should be deleted, otherwise conflicting requirements apply to this outfall.

Response 7: Outfall 040A is no longer in the Table on Page 11.

Comment 8: Part I A.2, pages 8-35. Outfall 079H is missing from the list of permitted features.

Response 8: This has been corrected.

Comment 9: Part I A.2, page 33-35. "TDS (mg/l)" is listed twice on the permitted features tables on these pages, and often imposes different requirements. The reporting requirement should be a daily average with 3,500 mg/l daily maximum.

Response 9: The requirement is to report both 30 day average values and daily maximum values. An effluent limit is only applied for the daily maximum value.

Comment 10: Part I A.2.? (Section numbering incorrect), Page 37. Mixing Zone Analysis. Outfall No. 049A discharges to a pond and eventually to a small ephemeral tributary at a location approximately 0.16 miles above the confluence with the South Fork Purgatoire River. The temperature of this discharge is expected to normalize by it reaches the South Fork Purgatoire River. Consequently, XTO believes that a Mixing Zone Analysis is not required as the effluent temperature should be equivalent to that of the receiving water by the time they join.

Response 10: Mixing zone study requirements have been removed.

Comment 11: Part I B.1, page 38. The "Facilities Operation and Maintenance" section includes language that has changed from the prior permit. Specifically, this section states that "[p]roper operation and maintenance also includes effective performance, and adequate laboratory and process controls, . . ." The Division should clarify in the Permit or Fact Sheet that XTO's use of an EPA-approved laboratory, which follows EPA process controls, meets the Division requirement for the permittee to have "adequate laboratory and process controls."

Response 11: The suggested language is inappropriate to include in the permit. The Clean Water Act does not have requirements regarding laboratories being EPA approved for Clean Water Act purposes. This is distinct from other major environmental acts such as the Safe Drinking Water Act. However many permittees use laboratories that have EPA approval for other major environmental acts, and the use of these laboratories is a good practice However since the Clean Water Act framework does not require laboratory approval it cannot formally be used in the permit as way to comply with O&M requirements.

Comment 12: Part I B.2, page 38. In establishing a compliance schedule to meet chloride and dissolved lead final limits, the Draft Permit notes that "the permittee was given time to conduct extensive research into resolving potential compliance issues with dissolved copper, dissolved selenium, boron, chloride, and total recoverable iron." Because XTO was not previously provided with a compliance schedule for dissolved lead, the Division should provide XTO with an extended compliance schedule to assess this parameter.

Response 12: The compliance schedule for lead has been placed in a separate compliance schedule and an additional six months has been included in the time period to comply with the new permit limitations.

Comment 13: Part I B.2.c, page 39. The Draft Permit includes new language that was not in the prior permit. As part of the Compliance Schedule section for WET, the Draft Permit states: Regulation 61.8(3)(n)(i) states that a report should be submitted to the Division no later than 14 calendar days following each date identified in the schedule of compliance. The 14 days have already been incorporated into the above dates and therefore all reports are due on or before the date listed in the table.

(emphasis added). *See also* Part II A.5, page 46. The Division has not provided clarity as to the compliance reporting dates and whether the new language applies to only the WET compliance schedules or all compliance schedules.

Response 13: The language refers to all narrative compliance submittals, including all compliance schedule reports and special studies.

Comment 14: Part I B.3, page 39-40. As discussed in the Comment Letter, using low-flow data from gaging stations in the South Fork of the Purgatoire River will result in IWC values < 9.1% for outfalls 019A, 022A, 023A, 079H, 080H, and 049A, thereby changing the WET testing protocol from chronic to acute for these outfalls. These outfalls would then need to be added to the Acute WET Testing table on page 42.

Response 14: This has been addressed in responses to previous comments.

Comment 15: Part I B.3.b, page 40-41. This section includes two sentences that state: "The IWC for this permit has been determined to be 100% effluent." However, the IWCs listed prior to this section in the Draft Permit at Part I B.3, page 40, as well as the Fact Sheet, pages 42-43, contradict this statement. These sentences should be eliminated or revised to reference the IWCs presented in the other sections of the Draft Permit and Fact Sheet.

Response 15: The language in the permit has been revised for clarity.

Comment 16: Part I B.3, page 40. The "List of Outfalls and Associated Facilities, Flows (cfs), Receiving Streams, and IWC: CHRONIC" incorrectly lists outfall 036G as being located in Ciruela Canyon – COARLA06a, when it belongs in Lopez Canyon

Response 16: The correction has been made.

Comment 17: Part I B.3.a, page 40; B.4.a, page 42. Regarding chronic WET testing, the Draft Permit requires XTO to "submit all laboratory statistical summary sheets, summaries of the determination of a valid, invalid or inconclusive test, and copies of the chain of custody forms, along with the DMR for the reporting period." This is not necessary for 25 outfalls and will impose substantial administrative burdens and paperwork requirements.

Response 17: This requirement is appropriate and is applied in all permits. Given the unique nature of WET testing, it is important that the Division have more detailed information regarding the results of the test and the way it was conducted.

Comment 18: Part I C.12, page 45. The Draft Permit requires a minimum sampling frequency to obtain six values for calculating Lower Confidence Limit ("LCL") Concentrations. As discussed in the permit comments, conditions beyond the control of XTO (e.g., wildfire, cold weather, floods, heavy snows, etc.) may inhibit the permittee's ability to collect six samples per semi-annual reporting period. The permit should acknowledge this and provide guidance for cases where $n \leq 5$. In addition, the Division has failed to consider that as water production in the Basin declines, outfalls may be operated intermittently. As such, it is possible that the

minimum number of values may not be obtained where an outfall is not used for months at a time. The final permit should account for these potential operational changes and only require sampling on a monthly basis.

Response 18: The minimum sampling requirement for SAR is monthly. The minimum number of samples needed to report compliance using the LCL method is 5. The inability for a permittee to collect samples due to causes such as weather is addressed in responses to other comments. The Division understands that operational changes within the control of the permittee such as intermittent operation of outfalls and included a discussion in the draft fact sheet that encouraged the permittee to anticipate these operational changes and collect the minimum number of samples needed to report compliance using the LCL method in advance of outfall shutdown, be it temporary or permanent. To the extent these operational changes cannot be anticipated, and the more frequent sampling cannot be conducted for whatever reason, the permittee should follow the instructions for reporting the cause of non-compliance included for weather related incidents, and report the operational constraints that led to the non-compliance.

Comment 19: Part I D.1, page 49. The Draft Permit requires that data gathered in compliance with Part I.A or Part I.B shall be reported on a monthly basis. This is a change from the prior permit, which required quarterly monitoring. There is no reason for this change. The data are generally consistent with little variability, as demonstrated by several years of data. Such a requirement is unduly burdensome on the permittee. It is also inconsistent with comments in the Fact Sheet by the Division that there is too much data to analyze; more frequent reporting will trigger Division data reviews 12 times per year, rather than 4 times per year.

Response 19: There is no change in reporting frequency from the previous permit. The Division has clarified this in the permit. The reporting frequency conforms to the monitoring frequency. So for example parameters that are monitored monthly, such as EC, SAR, Flow and bicarbonate, will continue to be reported monthly. Parameters that are monitored less frequently, such as quarterly, semi-annually, and annually, will be reported on that same frequency, quarterly, semi-annually, or annually.

Comment 20: Part II A.3, page 53. In the "Noncompliance Notification" section, the Division proposes requiring that XTO "shall give advance notice to the Division, in writing, of any planned changes in the permitted facility or activity that may result in noncompliance with the permit requirements." XTO may not always be able to provide the Division with any notification of "activity that may result in noncompliance," such as weather events. This sentence should be rephrased to make it clear that advance written notice is only required when planned changes or planned activities may result in noncompliance. Unplanned changes could be upsets at the facilities and should be covered by the standard upset provisions in the permit.

Response 20: Unplanned events are addressed in Part II. A.3.b of the permit.

XTO: comments on the Fact Sheet

Comment 1: Part III, page 6. The Fact Sheet explains that the modified SAR effluent limits did not become effective until April 1, 2014. The Fact Sheet also states that "Any value reported for the first quarter of 2014 prior to the effluent limits becoming effective is not considered a permit violation and those values are included solely for illustrative purposes regarding 'extent of exceedances.'" 48062 Fact Sheet at 6. The Fact Sheet incorrectly characterizes SAR values reported in the first quarter of 2014 as "exceedances" in the chart on page 6. The following chart correctly identifies the SAR exceedances in April and May 2014. The Division must revise the Fact Sheet to correct this error.

Outfall	Current SAR Effluent Limit	Number of SAR Exceedances	SAR Exceedance Values
014A	63.4	2	74.6, 76.8

Response 1: The Division included the caveat that the results were "solely for illustrative purposes regarding extent of exceedances". In context the information was presented for the purpose of informing a determination that the effluent limits should be revised for this renewal permit.

Comment 2: Part III, page 12. In the "Water Quality Based Limitation" discussion section, the Division states that some of the outfalls in this permit discharge "directly into the South Fork (049A)," however, this outfall is not a direct discharge. This statement should be deleted.

Response 2: The documents have been revised and 049A is now designated as discharging to an unnamed tributary of the South Fork of stream segment COARLA06A and limitations have been changed accordingly.

Comment 3: Part III, page 14. In the "Proposed WET Testing Modification" section, the Fact Sheet states that the "discussion will focus on the South Fork and its tributaries and the discharges to the Purgatoire River upstream of the South Fork, as the outfalls within this permit (CO0048062) discharge into this watershed." The Fact Sheet should be corrected, because segment COARLA06a (which is covered by this permit) discharges into both the Purgatoire and the Lorencito.

Response 3: This section of the fact sheet has been revised.

Comment 4: Part III, page 15. The Division has not provided any explanation regarding how it calculated the IWCs ranges in this Draft Permit based on what the Division refers to as a "tributary-based IWC approach." The Division must explain how it calculated these percentages.

Response 4: Additional information has been provided

Comment 5: Part III, page 15. The Division states that "even chronic limitations are likely to be attained for the majority of outfalls under the renewal permit" but does not provide any basis or explanation for this statement. The WET test pass/fail calculation presented in the

Draft Permits has not been tested, therefore the Division has no basis upon which to conclude that the new proposed limitations can be attained. A compliance schedule should be issued.

Response 5: Additional information has been provided.

Comment 6: Part III, page 15. The Division has provided no explanation to justify the application of downstream standards upstream. The Fact Sheet states that "for some of the outfalls which discharge into the canyons that drain into the South Fork or the Purgatoire that do not themselves have all of the aquatic life standards, chronic WET, if applied, is to protect the *downstream* aquatic life designated uses." (emphasis in original). This explanation is flawed, in part because the effluent may not even reach the South Fork or the Purgatoire. WET testing requirements that were applied to outfalls that fall within this category should be removed.

Response 6: The Division protects discharges that reach downstream segments. The Division has accepted evidence provided by the permittees that was provided for certain outfalls that demonstrated those outfalls do not reach the downstream segment.

Comment 7: Part IV, page 16. The Division provides a description for COARLA06a ("tributaries to the South Fork of the Purgatoire River, Apache Canyon (tributary to the Purgatoire River") that is inconsistent with the description it provides for the same waterbody in Permit No. CO-0048054 ("various canyons within the Lorencito Canyon watershed."). The Division should be consistent in its definition of this waterbody. Segment COARLA06a discharges into both the Purgatoire and the Lorencito.

Response 7: Segment 06a is a "catch all segment" that encompasses a number of tributaries. The description in the WQA is directly as it is expressed in the segmentation. The Division intentionally tailored the description for each fact sheet to provide clarity in regards to the specific named tributaries that are relevant to the permit, which may not have been named in the formal segment description.

Comment 8: Part IV, page 16. Regarding WET testing, the Fact Sheet states that "[n]o changes to the permit are warranted as a result of this modification request." However, the Fact Sheet goes on to identify changes that have been made to WET testing in the permit. This reference should be deleted from the Fact Sheet.

Response 8: The fact sheet language regarding the revisions requested by the permittee and WET requirements has been revised.

Comment 9: Part VI B.1, page 19. The Fact Sheet presents a table of alleged effluent limitation violations of the existing permit. However, these are not effluent limitation violations. XTO met with the Division in June 2014 to discuss these alleged violations. An accurate list of DMR violations is presented below. The Division should correct Table VI-3 based upon the following information:

Outfall	DMR Date	Parameter	Units	Permit Limitation		DMR Value	Type of Limitation	Over Limit %
014-A	4/30/2014	Sodium Absorption Ratio	Ratio	63.4	=	74.6	30DA AVG	15%
014-A	5/31/2014	Sodium Absorption Ratio	Ratio	63.4	=	76.8	30DA AVG	17%
014-A	5/31/2014	Conductivity	dS/m	2.37	=	2.40	30DA AVG	1%

Response 9: This has been corrected**.**

Comment 10: Part VII.B, page 42. In the discussion of adjusted SAR, the Fact Sheet states that "[a]s outlined in the WQA, the approach to assigning limitations for the outfalls of this facility was different than the typical process of calculating SAR limitations. Instead, the SAR limitations are set at the maximum recorded value for each individual outfall (note that outliers were removed from consideration)." This statement is not accurate. The proposed effluent limits for SAR are set at the 85th percentile of the historic data, not the maximum recorded value.

Response 10: This was a typographical error and it has been corrected.

Comment 11: Part VII.B, page 43. The Fact Sheet states that testing requirements have been made "less restrictive, with lower IWC" for outfall 079-H. However, this outfall is not listed in the table of permitted outfalls in the Draft Permit. This reference should be deleted from the Fact Sheet.

Response 11: The fact sheet has been updated regarding WET. The permit and fact sheet have been updated to include 079-H in the list of permitted outfalls.

Comment 12: Part VII.B, page 43. The Fact Sheet states that WET testing for outfall 016G has a delayed effective date, but that date is not identified in the Draft Permit. The delayed effective date should be clearly stated in the Draft Permit.

Response 12: The correction has been made.

XTO: comments on the WQA

Comment 1: Table A-2b, pages 7-9. Every XTO outfall other than 032-A, 034-A, and 035-A are located in COARLA06a. Table A-2b should be corrected to reflect this.

Response 1: The correction has been made.